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### Profile of the New York Zoological Society

Founded in 1895, the New York Zoological Society consists today of six major divisions operating facilities in the United States and worldwide: the New York Zoological Park (Bronx Zoo); the New York Aquarium and Osborn Laboratories of Marine Sciences in Brooklyn; the Wildlife Survival Center on St. Catherines Island, Georgia; Wildlife Conservation International, (WCI), headquartered at the Bronx Zoo; and the City Zoos in Central Park, Prospect Park, and Flushing Meadows Park, soon to be renovated and managed by the Society. WCI supports active research projects in countries ranging from the People's Republic of China to Belize, and maintains stations in the Kibale Forest, Uganda; Valdes Peninsula, Argentina; and Amboseli National Park, Kenya. The Society's staff of 405 in all divisions includes curators, educators, veterinarians, animal keepers, research scientists, writers, administrators, artists and designers, photographers, gardeners, technicians, and a host of other support and maintenance specialists.

The Bronx Zoo and New York Aquarium are sensitive and popular tools for teaching environmental education in the nation's urban capital. Serving a metropolitan New York population of more than 17,000,000, as well as visitors from around the world, they combine nature, recreation, and education as do no other city institutions. In particular, they seek to arouse an interest in wild creatures and to stimulate compassion for them. In recent years, the captive collections of the Zoo and Aquarium, totaling more than 24,000 individual animals, have begun to fulfill a new, if unwanted role as long-term repositories for vanishing species, sustaining and perpetuating rare and delicate creatures which are disappearing in nature.

The Wildlife Survival Center, founded in 1974, is wholly devoted to the propagation and study of endangered species, and acts as a kind of distribution center for the renewal not only of zoo collections but also of nature itself.

The Osborn Laboratories of Marine Sciences, adjacent to the Aquarium and an integral part of its programs, has devoted its resources since 1968 to basic studies in the mechanisms of heredity, to the characteristics and cure of fish diseases (with a special view toward the application of this work to aquaculture), and to broad investigations in marine ecology.

The objective of Wildlife Conservation International is to save pieces of nature. WCI is the country's senior non-governmental program sponsoring international wildlife conservation and research. As George Schaller, WCI Director, has written, "We strive to obtain a better understanding of the structure, functioning and stability of large ecosystems and to apply this understanding to their conserva-

tion." WCI's distinctive approach has already resulted in the creation, enlargement, or strengthening of nearly fifty reserves and parks, and in the education of many to whom the future is entrusted.

The City Zoos Project, now in progress, will magnify the Society's public service throughout the New York metropolitan area, creating an entirely new and modern system of wildlife management and exhibition facilities, with emphasis on educational opportunities for children and adults alike. The three zoos are scheduled to be renovated and reopened by the end of the 1980s.

### 1983-84 Highlights and Vital Statistics

Attendance totaled 1,929,282 at the Bronx Zoo and 529,599 at the New York Aquarium between July 1, 1983, and June 30, 1984.

Membership in the Society reached 26,350, and about 45,000 individuals, foundations, and corporations contributed \$14,608,170 in dues and gifts.

Born or hatched at the Bronx Zoo, New York Aquarium, and Wildlife Survival Center during calendar 1983 were nearly 1,700 mammals, birds, reptiles, amphibians, and fishes, among them individuals of 62 endangered, threatened, and vulnerable species.

Noteworthy births and hatchings included Orlitza, Viktor, and Virgil, Przewalski's horses; Lucile, female harbor seal; Betty Bettong, female pen-tailed bettong; Big Mac, male pudu; three snow leopards; one white-handed gibbon; one white-headed piping guan; seven Pesquet's parrots; fifty Russell's vipers; eight radiated tortoises; and three Travancore tortoises.

At the end of 1983, the New York Zoological Society was responsible for 4,053 animals of 655 species at the Bronx Zoo; 276 animals of 40 species at the Wildlife Survival Center; and 21,064 of 311 species at the New York Aquarium. About 230 of these species are listed as endangered in some degree.

Interzoo breeding exchanges involved 610 animals loaned to or by 97 different institutions and the Society.

Construction of the Snow Leopard Exhibition at the Bronx Zoo began, and work on Jungle World and the Animal Health Center neared completion. Demolition at the Central Park Zoo prepared the way for building the new Zoo. A rare green-lace scorpionfish and giant crabs from Alaska and Japan were shown in new exhibits at the Aquarium.

Wildlife Conservation International (WCI) sponsored 55 projects in 28 countries including new efforts in Sierra Leone, Nepal, Thailand, Belize, Bolivia, and Chile.

# New York Zoological Society Annual Report 1983-84

## Outstanding Partnership

This special acknowledgement gratefully recognizes the support provided annually by the New York City Department of Cultural Affairs and the Natural Heritage Trust, a program of the New York State Office of Parks and Recreation, which partly funds the operation of the Bronx Zoo and the New York Aquarium.

Collaboration between the City and the New York Zoological Society, begun in 1895, has been essential to the development and maintenance of the Zoo and Aquarium over the years. This partnership has helped establish the Society as a leader in wildlife exhibition, education, and conservation, and has created for millions of New Yorkers and other visitors an important bridge to the natural world.



Recent of the black rhinos in sub-Saharan Africa were into horn trade. Today, some 13,000 animals remain, serves scattered over fourteen countries and made and inbreeding by their isolation. Survival of the five of them endangered, depends on a coherent program in zoos, an effort toward which the New York through the Bronx Zoo and Wildlife Conservation Fund/Bruce Coleman Inc.)

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The Bronx Zoo and New York  
Aquarium are supported in part by  
public funds provided by the New  
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Trust, a program of the New York  
State Office of Parks and Recreation.



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Now eighty-nine years old, the New York Zoological Society is preparing for its second century by updating several of its most important older facilities and building a series of new ones at the Bronx Zoo, New York Aquarium, and City zoos. A spacious and modern new Animal Health Center and the spectacular indoor exhibitions of Jungle World are both near completion and scheduled to open in 1985. Also under construction is a Himalayan habitat for snow leopards, and a host of other projects—described by William Conway in his General Director's report (page 9)—is underway.

These projects reflect an increasing public appreciation for the Society's goals and the growing dedication and support of the Society's Trustees, members, and widening circle of contributors. It is a pleasure to report that these combined sources produced \$14,608,170 last year, double the previous year's figure and by far the highest total in the Society's history. Included were \$7,974,885 for capital projects, \$2,920,673 for operating purposes, \$2,600,971 for endowment, \$997,246 in membership revenues, and \$114,394 in bequests.

This record is distinguished by the number of donors, some 45,000 in all, and by some outstanding individual gifts. Jungle World has been named in honor of Trustee Enid A. Haupt, whose \$3,000,000 gift will substantially underwrite the magnificent tropical habitats being built there. Planning and construction of the new Central Park Zoo has been bolstered by gifts totaling \$1,345,000 from the late Lila Acheson Wallace, whose support throughout the years has been crucial to the development of this project. The \$1,000,000 contribution of honorary Chairman Laurance S. Rockefeller is designated to be shared by the Central Park Zoo and Discovery Cove at the Aquarium. Advisor Mrs. Gerrit P. Van de Bovenkamp has pledged \$1,360,000 over twenty-one years to support the work of Dr. George Schaller and the Society's international conservation program. And Honorary Trustee Mrs. James Walter Carter gave \$1,501,000, including funds for an endowed chair in Rainforest Biology to be held by Dr. Thomas Struhsaker. This is the fourth chair Mrs. Carter has endowed in the past two years.

Complementing the leadership represented by these gifts have been the exemplary efforts of the Society's volunteer committees and of the staffs in Public Affairs and every department for which program support is sought. Peter C.R. Huang and Arthur Hauspurg chaired the Business Committee for a second



Moose gives his one-year-old daughter E.P. a lift in the Sea Lion Pool on Zoo Court.

year, and corporate contributions increased by more than thirty percent to \$639,000. The Women's Committee in Julie Kammerer's first year of presidency continued its special work on behalf of the Society, stirring interest through its many activities and raising funds through an auction at Christie's and a theater benefit. The Aquarium and Osborn Laboratories Planning Committee had an extraordinary year under chairman Dr. Henry Clay Frick II, raising \$376,000, or ninety-three percent more than last year. And the Conservation Committee, under outgoing Chairman Frank Y. Larkin and incoming Chairman John Pierrepont, also reached new heights, with a total of \$3,251,000 raised to support endowment and field projects throughout the world.

With the death of Mrs. Wallace on May 8, 1984, the Society lost a friend whose interest in and support of our work was unparalleled. She served as a Trustee from 1969 to 1980 and as an Honorary Trustee thereafter, though her association with the Society dated back to 1955. As benefactress of the World of Birds and planning for the new Central Park Zoo, she will long be remembered by those who care about the people of New York and the future of wildlife.

We also record with sadness the deaths of two longstanding and irreplaceable colleagues. William Bridges was the Society's Curator of Publications from 1935 to 1966, during which time he edited 186 issues of *Animal Kingdom*, 124 of *Zoologica*, thirty-one annual reports, and practically every printed word that came out of the Zoo and Aquarium. Among the many books he wrote is *Gathering of Animals*, which chronicles the Society's first seventy-five years. George Wall Merck served with distinction as Secretary of the Society from 1959 to 1964, as Trustee from 1960 to 1980, and as Advisor since 1981. He was an active member of several committees, and his 1961 fieldwork in the Sudan helped strengthen the Society's conservation efforts in Africa.

Though still active as a Trustee, Charles W. Nichols, Jr., stepped down as Chairman of the Executive Committee, a post he had held since 1976. He was instrumental in establishing the Society's strong conservation program in Africa, and continues to be an inspiration in that and other areas. Mr. Nichols was succeeded as Executive Committee Chairman by Frank Y. Larkin, a Trustee since 1973 and Chairman of the Conservation Committee since 1976.



Other significant changes involve the Board of Advisors, to which we welcome Amalia Lacroze de Fortabat, a staunch backer of the Society's conservation work in Argentina; Mrs. L. Emery Katzenbach and Robert Wood Johnson IV, who have been associated with the new Central Park Zoo and other projects; and John N. Irwin III, Michael T. Martin, and Edith McBean, all active members of the Aquarium and Osborn Laboratories Planning Committee.

Finally, we are pleased to note a fitting tribute to General Director William Conway, who has guided the Bronx Zoo since 1961 and the Society since 1966 with vision and enviable versatility. On December 1, 1983, he was appointed by His Royal Highness Prince Bernhard of the Netherlands to the highest rank, that of Commandeur, in the Order of the Golden Ark for his leadership in the conservation of the world's fauna and flora.

**Howard Phipps, Jr.**  
President



The Herpetology staff needed help during the "Great Snake Debate" at the Society's annual meeting in Avery Fisher Hall.





### **City constituencies and wildlife conservation**

Recent studies agree that little of nature will survive the onslaught of human population increase and economic exploitation. For most animal species facing extinction—that vast multitude of the small-sized and the little-known—there is no chance for survival. Some wildlife communities can be sustained in nature reserves, and some of the larger, more spectacular creatures that have lost their homes, either permanently or temporarily, must be sustained in captivity.

Ironically, though inevitably, a large portion of the obligation in this effort has fallen to urban people. It is we who attempt to keep some few species going by protecting them in zoos, and, more broadly, by furthering conditions for sustaining them in their homelands. Zoological parks are the only institutions engaged in the preservation of international wildlife that are supported, for the most part, by municipalities. By establishing zoos, cities have come to the aid of numerous exotic species, inheriting former- and latter-day conservation ethics. Surely the city fathers of St. Louis made no conscious commitment to the Speke's gazelle of Africa or the black lemur of Madagascar. New York's Department of Cultural Affairs has approved no special budget line for the preservation of the Chinese alligator, the Mongolian wild horse, or the Mauritius pink pigeon (although the DCA is well aware of these programs and takes proper pride in them).

Nevertheless, municipal zoo services are beginning to make a critical contribution to the survival of vanishing species, and that support could come to represent a new, more widespread and personal involvement in the task of saving wildlife for the future. Zoos, as a result, may be on the verge of becoming new kinds of institutions in human history. They are institutions that human society needs: high profile organizations in critical population centers that act to help sustain the earth's biological wealth—no matter where it originates—institutions that can help to build a worldwide constituency for a unique part of nature or for a species losing its native home.

### **New facilities, new plans**

On the basis of the Society's historical partnership with the City and the people of New York, a new institution *is* emerging here. At no time in the Society's eighty-nine year history has so much construction and reconstruction been underway. It is setting the stage for the future.

At the Aquarium, a major planning effort has begun with the design of an exhibition and education facility that will make innovative use of living exhibits to teach, and to excite visitors to learn. This is part of our constituency building. The complex, called *Discovery Cove*, will take the visitor through simulated coastal habitats and exhibits devoted to the morphological characteristics and adaptations of marine organisms. Participatory displays, colorful and informative graphics, videotapes, films, and docent guides will reveal something of the sea's mysteries and its importance to human society. The whole will be focused neither upon the child nor the adult, but upon the family. It is experimental in the most creative sense of the word and will break new ground.



Instruction complements preservation and propagation at the World of Birds.

Already breaking new ground are the great habitat displays and interpretive galleries of *Jungle World* in Wild Asia. Scheduled to open in 1985, this largest of the Bronx Zoo's buildings will attempt to do the undoable. It will seek to convey the wonder of the ancient Asian rain forests that are now so rapidly being felled by landless agriculturalists and careless lumber companies. The task of creating the exhibition sometimes seems as awesome as the forests themselves; big living primates have never been successfully kept in a captive habitat of live plants. Nor has any exhibition successfully imitated the rain forest's giant buttress-root trees. *Jungle World* is attempting to do both, and much more, to broaden its visitors' environmental literacy and to inspire respect for the beauty, complexity, and vital importance of this remote part of the world.

More environmental exhibits and more marine mammals, better cared for, are the objectives of yet another Aquarium exhibition now on the drawing boards. *Sea Cliffs* will house sea otters, seals, penguins, and walruses in a continuous sequence of rocky coast habitats. It will run nearly the length of the developed part of the Aquarium and provide both above-water and below-water viewing. This exhibition, like *Discovery Cove*, has received strong aid and encouragement from the Department of Cultural Affairs and Brooklyn Borough President Howard Golden, who are also making possible the development of a critically needed new water supply for the Aquarium in a project due to begin construction in late 1984.

Cash-flow problems, amidst the wealth of projects already underway, led to a temporary stop in construction of the Zoo's new *Snow Leopard Exhibition*. About forty percent complete, the hillside home for these beautiful but gravely endangered



big cats, simulating their rugged Himalayan habitat, will resume construction in 1985 and open in the spring of 1986. The NYZS breeding group of snow leopards is one of the zoo world's finest, and the new facility will house as many as twenty-four animals, helping directly to sustain a species that probably numbers less than 1,000 in its Central Asian range.

Of exceptional significance is the near completion of the Society's *Animal Health Center*. The structure will not only provide for animal health care at the Bronx Zoo, the Aquarium, and the soon-to-be remodeled City zoos, but also for greatly expanded research into the care and reproduction of endangered species. It constitutes a major step toward making the Society a new kind of institution, a commitment to the present and future health and propagation of our wildlife populations.

The search for knowledge needed to sustain nature's vanishing species through times of stress in their homelands must be close-up and intense, as well as global and broad-scale. Advances in endangered species cryobiology, in embryo transfer



Recent renovation of the beluga whale tank was part of continuing renewal at the Aquarium.



Guido, a spectacled langur, helped test the mangrove swamp habitat in Jungle World.

and artificial insemination techniques are goals of the Society's Reproductive Studies Unit. In 1981, the first successful embryo transfer from an endangered to a domestic species resulted in the birth of a gaur to a holstein cow at the Bronx Zoo. Such practices may prove essential to economically realistic plans for the long-term survival of nature reserves and captive gene-pool collections for many species. The Animal Health Center, with its endocrinology, cryobiology, clinical, and other laboratories, will provide the Society with an impressive tool devoted to more productive, economical, and genetically sound captive breeding.

The Center has been made possible by major commitments from the City of New York through its Department of Cultural Affairs and Bronx Borough President Stanley Simon, and by contributions from many individual donors and foundations.

Another project involves the Bronx Zoo's aging infrastructure. With fuel conservation a high priority, the Society undertook a comprehensive study of the current arrangement for supplying energy to the Zoo. The report resulted in a decision by the Board of Trustees to build a new cogeneration and district heating system. The new installation, which will be funded by a combination of City, Federal, and Society dollars, will result in considerable long-term energy savings to the Zoological Society and to New York City, which contributes substantially to help fund the Society's annual utility costs.

### **Reclaiming Zoo Court**

The remarkable assemblage of Beaux-Arts buildings known as *Zoo Court* was begun at the close of the last century and is indelibly associated with the Zoo's history. We think it can now be the heart and soul of the Society's effort to build its constituency, a door to the next century.

Zoo Court will be a celebration of life, an animal treasury in a remarkable setting of Old World elegance and ceremony, a living pageant dedicated to developing within the City a greater loyalty to the Earth and its creatures. Its aim will be to attract the involvement of city people with distant wildlife; to help make New York City an environmentally enlightened metropolis with a global perspective; to exert pressures upon the school systems for new emphases in education; to provide more answers to more questions, compellingly.

Since its conception in 1896, Zoo Court has been the institutional and symbolic center of the Zoo and of the New York





The great dome of the Elephant House on Zoo Court.

Zoological Society. A fifth of a mile long and 400 feet wide, the court covers nearly ten acres. Six buildings surround the tree-lined central mall, with the great Fountain Circle and grand entrance stairway at one end and the magnificent domed Elephant House at the other. Based upon European traditions, the buildings are individually distinctive and collectively harmonious, and most are decorated with handsome animal sculptures by some of the best-known artists of their period. They provide a specialized setting to be found nowhere else, one of remarkable dignity and grace. But their present menage of wire cages and worn fences do not.

Reclaiming the Court will take place in phases, beginning with the restoration of the imposing Elephant House and its abutting grounds and exhibits. Entirely new exhibitions will be created for the handsome old Bird House, the Monkey House, and the richly decorated Lion House. New offices and meeting rooms will accommodate Wildlife Conservation International, the Society's worldwide conservation program, and the expanding Education Department. There will be classrooms, seminar facilities, and a sorely needed auditorium.

The Elephant House, only partly usable in recent years, will again exhibit elephants and rhinos. Its unusual sculpture and palatial architecture will be restored, and major areas of the interior will be given over to interpretive expositions on the relationship of man to these vanishing creatures, and on the need and means for their preservation. Outdoors, bare exercise yards will be transformed into wooded and greatly enlarged habitat displays. An Animal Behavior Theater seating up to 1,000 visitors will be developed for educational programs, including the popular elephant behavior demonstrations.

But not all the Zoo Court structures will be returned to their original purposes. The Bird House, Lion House, and Monkey House are the subject of intense and ongoing studies. They have housed creatures now better exhibited in more spacious areas elsewhere in the Zoo. But they offer the chance to create entirely new kinds of exhibits, designed to teach as well as delight.

Animal societies will be one major theme. Visitors will be able to observe and explore the nature of group living, its advantages and disadvantages in other kinds of creatures, and the animals themselves will live in a more natural state of interrelatedness. Reptiles and amphibians, always among the most popular of zoo animals, will be the subject of a major ex-



Cages demolished in January will be replaced by habitat environments in the new Central Park Zoo.

hibition. The relationship between predators and prey will provide the basis for an evolutionary exposition of animal life, while a new effort will be made to display invertebrates, which are usually overlooked in zoo exhibition. Several of the buildings will incorporate classrooms within the exhibitions, an innovation that is already being introduced at Jungle World and should greatly enhance the Zoo's education program.

The entire Court complex will comprise a "Winter Zoo," a single, concentrated area in the 265-acre Zoological Park where a nexus of compelling exhibits and interpretive displays may be conveniently visited in the worst of weather—all meant to affect the visitor's perspective of the Earth and to encourage concern for its future.

### **A metropolitan zoo system**

The constituency addressed by this extensive renewal at the Bronx Zoo and Aquarium will be considerably augmented by the redevelopment of the borough zoos in *Central Park*, *Prospect Park*, and *Flushing Meadows Park*. Redesigned by the Society and rebuilt by the City, the three zoos will become, under the Society's management, part of a metropolitan zoo system; the first of its kind.

The transformation of each zoo has been planned not only with the opportunities and limitations of its particular site in mind, but also to interlock with the other zoos and the programs of the Bronx Zoo and New York Aquarium. Each will be specialized and will reinforce the total presentation of wildlife in the City. Each will contribute to the City's diversity and quality of life and will reach out to various levels of public participation, providing a basic living resource for children and adults, for the school system and family groups, for the serious student and the interested spectator in every part of the metropolitan area.

Preliminary designs have been completed and approved for all three zoos. Despite delays resulting from high bids and the need to redesign, construction of the new Central Park Zoo should begin in 1984.

### **Diversity into unity**

With work progressing in so many areas, the Society is more and more becoming the multifaceted yet coherent institution that is needed to address the urgent issue of conservation around the globe. Only the New York Zoological Society maintains a census of wildebeest in the Serengeti, teaches

ecology to gifted children, determines the genetic mechanism of sexual dimorphism in fishes and the endocrine cycles of giant pandas, and provides the common ground to link these activities. Only the Zoological Society breeds snow leopards while studying them in nature, gives elephant rides and builds rain forests, trains Ugandan ecologists and provides homes for anemones, pythons, and pink pigeons.

But, after all, only the New York Zoological Society, among wildlife organizations, can draw upon a highly qualified staff so diverse that it includes ecologists, endocrinologists, field zoologists, pathologists, graphic artists, lawyers, accountants, geneticists, ichthyologists, ethologists, writers, editors, engineers, photographers, animal keepers, landscape architects, planners, and many more.

Together, they can do much more than just care *about* nature. They can help to develop the ability and the desire in human society to *take care of* nature.

**William Conway**  
General Director







### **Wildlife détente**

With the assistance of the United States Fish and Wildlife Service and under a cooperative environmental program and exchange agreement between the U.S. and the U.S.S.R., the Bronx Zoo has already received specimens of two rare and beautiful species from Russia. Vulcan and Varna, two Przewalski's (or Mongolian wild) horses from the Russian nature reserve of Askania Nova, arrived in 1982 for the purpose of breeding and to introduce new blood into the stock maintained by U.S. zoos. This last distinct species of wild horse is considered to be extinct in nature, and Vulcan, as the grandson of the last wild-caught Przewalski's mare, is one of the strongest links in the hereditary chain.

On August 21, 1983, Orlitza, the first foal sired by Vulcan in the U.S., was born. Since then, Vulcan has sired three other young, including Viktor, whose dam is Varna. It is hoped that these and other births will help to decrease the threat of inbreeding in the U.S. population of the species.

Two days after Orlitza's birth, three Siberian tigers—the females Alisa and Astra, and the male Tulyp (Tulip)—arrived in New York from the Moscow Zoo. Alisa remained at the Bronx Zoo, one of the principal breeding centers for the species, while the others went on to other U.S. zoos. Because of the small number of founder animals that have produced most Siberian tigers in the U.S., the importation and breeding success of these new founders from Russia is vital to the prevention of inbreeding and the survival of this species in captivity.

### **Extraordinary offspring**

E.P. (Extraordinary Pinniped), the first California sea lion born in the new Sea Lion Pool, celebrated her first birthday in June 1984. To her keepers, she became extraordinary when her mother died several weeks after her birth, and she endeared herself to them while being hand-reared. After months of bottles filled with cream, ground fish, and vitamins, she was slowly weaned and introduced to the pool and the older sea lions. Today, she is a regular, though privileged member of the group.

The pudu breeding program has already had encouraging results in its initial year. Four of these tiny deer were brought to the Bronx Zoo in April 1983 from a breeding station in Chile that had been set up by Associate Curator Mark MacNamara. The first pudu fawn born in the United States, a male weighing one and a half pounds, arrived on December 11, and a second fawn was born in March. In April, a young male from the

Rotterdam Zoo was imported to increase the genetic base of this rare species at the Zoo.

On May 20, 1984, the Society's snow leopard matriarch, Shanda, gave birth to another litter of three, bringing her total offspring count to seventeen. Shanda's older offspring live in zoos all over North America, as well as the Netherlands and Great Britain. Later in 1984, Rose, one of Shanda's daughters and herself a successful breeder, will travel to the Moscow Zoo. In exchange, the Bronx Zoo will receive a male snow leopard as a part of the U.S.-U.S.S.R. cooperative program. The world captive population now stands at about 300 specimens, while the endangered wild population is generally estimated at fewer than 1,000.

### **The social scene**

Patience with the Indian rhinos in Wild Asia seems to have paid off this year. Patrick, a ten-year-old male, and Radha, a ten-year-old female, bred for the first time after more than two years of anticipation by the staff. Many attempts were made to bring these rather solitary animals together at the optimum time, and mating finally occurred around midnight during a twenty-four-hour watch by Senior Keepers Robert Terracuso and Patrick Thomas on Thanksgiving Day, 1983. Two additional male rhinos were acquired this year in an attempt to enlarge the group's genetic base and to encourage other matings.



One of four offspring sired by Vulcan, the Przewalski's horse on exchange from Russia.





Indian rhinos Pinkie and Rhada, the latter a prospective mother, at home in Wild Asia.

When the Central Park Zoo entered its reconstruction phase, all the animals housed there were transferred to other zoos. The most endangered animals in that collection, the lowland gorillas Kongo, Lulu, Pattycake, and Carolyn, came to the Bronx Zoo and have since integrated with the go-

rillas already here. Carolyn, at forty-five the oldest female in the country, has been housed alone much of her life but now seems to enjoy the companionship of the youngsters Julia and Kelly. Lulu and Pattycake have joined Bendera's troop, making this social group of six adult gorillas the largest ever exhibited at the Zoo. Kongo, an impressive mature male, has taken the longest time to settle in, but now he is part of the breeding program and can be seen with the females when they're not with Bendera.

#### Staff activities

Early in 1984, Curator James G. Doherty traveled to Cheyenne, Wyoming, to participate in a meeting on the black-footed ferret called by the Wyoming Fish and Game Department. Mr. Doherty is one of a team of four who will design the first captive-breeding facility for this highly endangered species, which is known only in a single and small wild colony.

In May 1984, Fred Koontz joined the Mammalogy Department as Curatorial Trainee, having recently completed his PhD in zoology at the University of Maryland. While pursuing his graduate degree, Dr. Koontz was associated with the National Zoological Park's Department of Zoological Research, where his studies focused primarily on the ethology of animal communication.

#### Mammal Census, Bronx Zoo (as of December 31, 1983)

Orders	Families	Species and subspecies	Specimens in Zoo	Specimens owned
Marsupialia—Kangaroos, phalanger, etc.	2	4	69	76
Insectivora—Shrews, hedgehogs	2	2	7	7
Chiroptera—Bats	3	9	557 ±	569 ±
Primates—Apes, monkeys, marmosets, etc.	6	25	152	165
Edentata—Armadillos, sloths, anteaters	2	2	4	2
Rodentia—Squirrels, mice, porcupines, etc.	11	21	215	210
Carnivora—Bears, raccoons, cats, dogs, etc.	6	27	95	87
Pinnipedia—Seals, sea lions, etc.	2	2	6	7
Proboscidae—Elephants	1	2	6	7
Perissodactyla—Horses, rhinoceroses, etc.	3	6	38	37
Artiodactyla—Cattle, sheep, antelope, etc.	8	32	530	566
<b>Totals</b>	<b>46</b>	<b>132</b>	<b>1,679 ±</b>	<b>1,733 ±</b>

N.B. Specimens in Zoo include 50 on loan to the NYZS from other collections. Specimens owned include 96 on loan to other collections from the NYZS. There were 61 species listed as endangered in some degree. Births totaled 914.

### Interventions for conservation

Like the Society as a whole, the Ornithology Department has become increasingly concerned with problems and programs of international conservation. In Guam, after years of alarming decline, seven of the fifteen endemic bird species became extinct in the last year. Working with forestry officials on Guam, the Society and the National and Philadelphia zoos are attempting to preserve, through captive breeding, two of the species still remaining. A pair of Guam kingfishers arrived at the Bronx Zoo in early 1984, and Guam rails are expected in the near future.

The Society also assisted the United States Fish and Wildlife Service in two cases involving birds imported into the United States in violation of CITES regulations and the Lacey Act. First, the Society was asked to hold a group of four solitary tinamous, which will be donated to the Zoo at some future date. Then, in November 1983, the Society and nine other institutions agreed to care for a group of 100 palm cockatoos and twenty-eight eclectus parrots illegally exported from Indonesia. Affidavits from the Indonesian government attesting to the birds' protected status in that country and confirming the fact that no permits had been issued for the collecting of the birds were obtained with the Society's help by the U.S. Fish and Wildlife Service and the Department of Justice. It is hoped that a better organized system for handling seized wildlife and, in consequence, a more uniform enforcement of U.S. laws for wildlife conservation will result from this experience.

### The New Guinea project

Forty-seven birds collected by the 1983 expedition to Papua New Guinea, including twelve birds of paradise, arrived in New York in August and were divided among the participating institutions: the Philadelphia, Denver, National, and Bronx zoos. A pair of brown sicklebill birds of paradise and a single male ribbon-tailed bird of paradise went on exhibit at the World of Birds in the fall. Three different species of honeyeaters are also now on exhibit.

Curator Donald Bruning devoted a great deal of time to planning and negotiating permits for collecting birds in Papua New Guinea. Permission has also been obtained for a consortium of zoos to conduct salvage operations in areas where mining and lumbering will destroy large tracts of forest. The development of special travel tours for members of the Society and promotion of the Crater Mountain Park and the village of Ubaigubi as tourist destinations, should help to support the wildlife reserve.

Proposals for research funding by *National Geographic* have also been prepared, reviewed, and submitted. On June 29, Dr. Bruning again departed for Papua New Guinea to negotiate permits, initiate survey work for new parks and reserves, lead a members' tour, and direct and coordinate a collecting expedition of North American zoos that includes San Diego, Los Angeles, and Miami.

### Breeding, acquisition, and research

More than 1,600 eggs were laid during the year and over 300 chicks were reared in the nursery. Among the many significant hatchings to rare and endangered species were those of pink pigeons, Malayan wreathed hornbills, Pesquet's parrots, white-naped cranes, hooded cranes, Congo peacocks, and Malayan peacock pheasants. A white-headed piping guan and an ocellated turkey were hatched for the first time.

As the result of a successful cooperative effort to import twenty-five African pigmy geese, the Zoo received five of these birds to augment its already productive breeding program for the species. In September 1983, the Society's propagation of African pigmy geese was recognized with a Significant Achievement Award from the AAZPA.

Among those lost during the year were three of the Zoo's most valued and productive birds. Mrs. McNasty, mother of thirteen Andean condor chicks since 1976, including two that were successfully released into the wild in 1980, died in 1983. A



Rare Pesquet's parrot chicks hatched at St. Catherine's Island were hand-raised at the Bronx Zoo for the second year.

breeding pair of Malayan wreathed hornbills, which had nearly finished rearing their fifth chick in as many years, died in 1984. The chick was successfully fledged by the ornithology staff.

Research within the department continues to concentrate on the breeding biology and behavior of several rare and endangered species. Computerization of the egg log and census records will serve as a basis for extensive evaluations of incubation techniques, and allow monitoring of inbreeding and other genetic problems. In addition, daily keeper routines have been studied and redefined to reflect increased responsibilities generated by the success of the propagation program.

#### Staff activities

In September and October of 1983, Associate Curator Christine Sheppard led a group of NYZS members on a working tour of Patagonia. In addition to whale-watching and bird-spotting, tour members spent a week camping at Punta Tombo, where they banded more than 1,000 penguins. The tour was

part of an effort to conserve the Magellanic penguin. Dr. Sheppard continues to maintain the study book for the white-naped crane. She chaired the first meeting of the Species Survival Plan committee for that species in March of 1984 and presented a demographic analysis of the captive population at the regional AAZPA meeting in Philadelphia. Her recent research efforts have focused on the development of a new formula for hummingbird nectar and techniques for establishing normal intestinal flora in newly hatched chicks.

In addition to his activities in Papua New Guinea, Curator Bruning continues to serve on the Board of Directors of the AAZPA. As chairman of the AAZPA legislative committee, he has been deeply involved in the preparation and delivery of testimony before Congressional committees and Federal commissions regarding the protection of gorillas, rhino importation, marine mammal regulations, and other conservation problems. Dr. Bruning also continued to serve as secretary of the International Council for Bird Preservation—World Parrot Specialist Group.

#### Bird Census, Bronx Zoo (as of December 31, 1983)

Order	Families	Species and subspecies	Specimens in Zoo	Specimens owned
Struthioniformes—Ostriches	1	1	5	3
Rheiformes—Rheas	1	1	3	3
Casuariiformes—Cassowaries, emu	2	2	6	5
Tinamiformes—Tinamous	1	2	17	16
Sphenisciformes—Penguins	1	1	14	10
Pelicaniformes—Pelicans, cormorants	2	3	14	14
Ciconiiformes—Herons, storks, flamingos, etc.	5	15	83	87
Anseriformes—Swans, ducks, geese, screamers	9	55	223	238
Falconiformes—Vultures, hawks, eagles	3	7	14	15
Galliformes—Quail, pheasant, etc.	4	25	224	234
Gruiformes—Hemipodes, cranes, rails, etc.	6	25	120	123
Charadriiformes—Plovers, gulls, etc.	9	23	123	125
Columbiformes—Pigeons, doves	1	7	24	17
Psittaciformes—Parrots, etc.	1	16	37	35
Cuculiformes—Touracos	1	5	14	17
Strigiformes—Owls	2	8	20	21
Caprimulgiformes—Frogmouths	1	1	13	13
Apodiformes—Hummingbirds	1	1	1	1
Trogoniformes—Quetzals	1	1	5	5
Coraciiformes—Kingfishers, hornbills, etc.	5	14	33	30
Piciformes—Barbets, toucans, woodpeckers	2	8	18	19
Passeriformes—Perching birds	22	97	272	283
<b>Totals</b>	<b>81</b>	<b>318</b>	<b>1,283</b>	<b>1,314</b>

N.B. Specimens in Zoo include 62 on loan to the NYZS from other collections. Specimens owned include 94 on loan to other collections from the NYZS. There were 72 species listed as endangered in some degree. Hatchings totaled 329.

### The changing Reptile House

Opened in November 1899, the Reptile House is one of the Bronx Zoo's oldest buildings. Through its eighty-five years it has been home to thousands of reptiles and amphibians, half a dozen curators, and scores of keepers. Outside, the structure remains essentially unchanged, but inside, exhibits have been constantly added, subtracted, remodeled, and refurbished as management, breeding, and exhibition concepts have evolved over the years.

The past year was no exception. Improvements visible to the public included new exhibits for diamond pythons, tentacled snakes, Taylor's cantils, and Australian snake-necked turtles. At the Reptile Nursery, new labels were introduced to provide fuller information on the new babies, and a bulletin board was installed to introduce members of the department staff.

Equally important were behind-the-scenes changes. Crocodilian breeding quarters were provided with heated nesting stalls to induce egg-laying, and a closed-circuit video recording system was installed to monitor the breeding behavior of these and other reptiles in the collection.

The addition of 1,000 square feet of space to the second floor of the Reptile House was a major undertaking. The old canopy that formerly covered the crocodile exhibit was replaced with a truss-supported deck. This new section—"the west propagation platform"—provides space for housing adolescent crocodilians and turtles as well as reptile specimens to be displayed in the habitat exhibits being constructed in Jungle World.

### Breeding and acquisitions

With their improved breeding quarters behind the crocodilian exhibit, the Cuban and Siamese crocodiles both successfully nested during the year, and their young were proudly displayed in the Reptile House Nursery. Bog turtles, including one second-generation individual, reproduced for the eleventh consecutive year. Additional births and hatchings of note, out of a total of nearly 200, included fifty Russell's vipers, ten Kenya sand boas, twenty-one yellow anacondas, fourteen Venezuelan rattlesnakes, three Travancore tortoises, and four South American big-headed turtles.

Five diamond pythons and four water monitor lizards were received as gifts from Australia's Taronga Park Zoo and the Jakarta Zoo in Indonesia, respectively. The Roeding Park Zoo in Fresno, California, sent a Florida indigo snake and three Mexican beaded lizards. Four New Guinea green tree pythons were loaned by the Philadelphia, Fort Worth, and Tulsa zoos. Additionally, four pygmy monitors, two rhino iguanas, a Madagascan ground boa, and six sungazers were acquired for the collection.

### Staff activities

Under a grant from the New York State Department of Environmental Conservation, Curator John Behler began a two-year study on habitat utilization by the endangered bog turtle and the closely related spotted turtle of Bog Brook Unique Area in Putnam County, New York. He has marked more than 200 turtles there in the past decade and monitors their living patterns from winter hibernation retreats to breeding and feeding sites and back



Curator John Behler's ten-year study at Putnam County's Bog Brook Unique Area has been crucial in saving the endangered bog turtle.





With improved nesting areas, critically endangered Cuban crocodiles bred for the first time at the Bronx Zoo.

again. Mr. Behler also served as chairman of the Society for the Study of Amphibians and Reptiles' Conservation Committee and developed the SSAR Directory of State Non-game/Natural Heritage Program Coordinators. He led the Zoological Society's 1983 members' trip to Australia and the 1984 trip to the Wildlife Survival Center in Georgia and White Oak Plantation in Florida.

Superintendent Peter Brazaitis and his wife, Myrna Watanabe, coedited the IUCN/SSC Crocodile Specialists Group Newsletter. Brazaitis has begun a detailed study on the morphological characteristics of South American caiman skins and continues to identify endangered crocodilian species products for the U.S. Fish and Wildlife Service.

In cooperation with the Jacobi Hospital snakebite trauma team, members of the department responded to six serious snakebite emergencies. These included bites from an Australian death adder, a spitting cobra, an Asiatic cobra, a western diamondback, and two Arizona twin-spotted rattlesnakes. The victims—a reptile importer, three roadside reptile display employees, and two private collectors—have fully recovered.

#### Reptile and Amphibian Census, Bronx Zoo (as of December 31, 1983)

	Families	Species and subspecies	Specimens in Zoo	Specimens owned
<b>Amphibia orders</b>				
Caudata—Salamanders	1	4	10	10
Salientia—Frogs, toads	6	14	54	50
<b>Totals</b>	<b>7</b>	<b>18</b>	<b>64</b>	<b>60</b>
<b>Reptilia orders</b>				
Testudinata—Turtles	8	41	167	190
Crocodylia—Alligators, caimans, crocodiles	2	14	55	110
Squamata (Sauria)—Lizards	8	23	72	67
Squamata (Serpentes)—Snakes	8	68	309	313
<b>Totals</b>	<b>26</b>	<b>146</b>	<b>603</b>	<b>680</b>

N.B. Specimens in Zoo include 87 on loan to the NYZS from other collections. Specimens owned include 155 on loan to other collections from the NYZS. There were 63 species listed as endangered in some degree. Births and hatchings totaled 185.



#### **New crane and wallaby facilities**

With close support from the Saint Catherines Foundation staff, new facilities were created during the year for the Society's rapidly expanding crane breeding program on the island. Twelve large yards for breeding pairs and five smaller rearing yards for young birds were completed in September 1983. Occupying seven acres of wet meadow and marsh, the area provides an ideal habitat for nest-building and an abundant natural food supply of insects and amphibians. By making possible wild patterns of nesting, feeding, and foraging, the setting has proved a tremendous stimulus to breeding. Six of eight pairs introduced in the fall of 1983 have already produced fertile eggs, including a pair of wattled cranes that has been together for five years but never bred.

In June 1984, new quarters were completed for the Center's growing group of Parma wallabies. This species was long thought to be extinct, but in 1968 a few animals were found in their native New South Wales. The complex of four large yards with attached shelters will be seeded seasonally with a rotation of forage plants and should provide an ideal environment for these endangered marsupials from Australia.

#### **Mammal breeding and management**

The mammal collection, although in a period of transition, recorded fifty births among twelve species. A seasonal breeding schedule was implemented for the ungulate collection. Designed to concentrate births during the optimal climatic conditions of early spring, the schedule should be helpful in managing the age structure and genetic profile of the Center's herds, and in facilitating studies of behavioral development and mother-young interaction. In addition, young animals can be shipped off the island, to the Bronx Zoo and other institutions, during the fall and winter following birth, when the weather is not an obstacle.

In order to accommodate the growing Arabian oryx herd, the Center's collection of addax has now been dispersed to other breeding programs. The fifty-six young born during the six years addax were bred on Saint Catherines Island contributed significantly to the secure captive status of this endangered species.

Plans were made to establish a free-living group of ring-tailed lemurs on the grounds of the Survival Center. Although wild-caught individuals of various lemur species have bred well in captivity, reproduction in captive-born animals of some species

has been discouraging. It is hoped that eliminating spatial and behavioral constraints will encourage breeding as well as more natural social behavior and activity patterns in captive-born animals. The information gained from observing a free-living group may be useful to biologists interested in the reestablishment of animals in safe areas.

#### **Birds and reptiles**

The black curassow, least known and most vulnerable of the fowl-like Cracidae family of Central and South America, was one of several species added to the collection. Curassows are a major focus of the Center's propagation efforts, and the breeding of nocturnal and greater curassows prepared the way for the new species.

The program for St. Vincent's parrots, a species almost extinct in its isolated island habitat, was augmented by an additional breeding pair. And two pairs of the endangered white-naped crane and four of the threatened wattled cranes were acquired for the new crane breeding facility.

Notable among fifty-five chicks hatched were a record twenty-seven cranes representing all six species in the Center's collection. In the four years since the inception of the crane breeding program, eighty-seven chicks have been hatched, an unparalleled level of success for this difficult group. Five red-fronted macaws and seven Pesquet's parrots hatched during the year constitute the most successful captive breeding of these rare species.

The hatching of eight Florida sandhill crane eggs taken from wild parents in the Osceola National



The marshy areas of St. Catherines Island are perfectly suited to crane breeding.

Wildlife Refuge in Florida substantially expanded a program initiated last year to reintroduce this species to its former range in coastal Georgia. Undertaken in cooperation with efforts by the United States Fish and Wildlife Service to establish resident populations of the critically endangered whooping cranes, the program will use eggs taken from wild birds chosen as surrogate parents for whooping cranes.

Eight hatchings among the radiated tortoises was a new high at St. Catherines for this endangered species from the Malagasy Republic. Five Aldabra tortoises were acquired on breeding loan.

#### Research projects

Gwendolyn Murdock received a doctoral degree from the Georgia Institute of Technology for her comparative study of the activity patterns and social behavior of the Center's Arabian oryx, addax, and sable antelope herds.

As part of an ongoing study in reproductive physiology being conducted by the Society's Animal Health Department, four female gemsbok were artificially inseminated this spring. The goal is to

transfer embryos between females of this species and eventually between gemsbok and the closely related but critically endangered Arabian oryx. Although these techniques, originally developed in domestic animals, have proved more difficult to apply to exotic species than originally anticipated, they hold profound promise for the preservation of endangered species.

#### Staff activities and changes

John Simon, a graduate in wildlife ecology from Michigan State University, was named zoological technician in January 1984. In addition to assisting the curatorial staff in managing the collection, he will coordinate procurement of operating supplies and animal feed.

Selected for the intern program, now in its fourth year, were Patricia Lewis, a graduate in biology from Virginia Polytechnic Institute, and Kathleen Deutsch, an undergraduate in marine biology at Auburn University. Of seven interns who have completed training at the Wildlife Survival Center, four now hold permanent positions in zoological parks and two have gone on to study veterinary medicine.

#### Wildlife Survival Center Census (as of December 31, 1983)

	Families	Species and subspecies	Specimens at Center	Specimens owned
<b>Mammalia orders</b>				
Marsupialia—Wallabies	1	1	9	9
Primates—Lemurs	1	4	17	3
Perissodactyla—Zebras	1	1	14	12
Artiodactyla—Antelope	1	8	107	94
<b>Totals</b>	<b>4</b>	<b>14</b>	<b>147</b>	<b>118</b>
<b>Aves orders</b>				
Galliformes—Pheasants	2	3	15	10
Gruiformes—Cranes, bustards	1	7	48	47
Columbiformes—Pigeons	1	1	6	6
Psittaciformes—Parrots	1	7	33	31
Coraciiformes—Hornbills	1	4	21	17
<b>Totals</b>	<b>6</b>	<b>22</b>	<b>123</b>	<b>111</b>
<b>Reptilia orders</b>				
Testudinata—Tortoises	1	4	47	29

N.B. Specimens at Center include 61 on loan to the NYZS from other collections. Specimens owned include 4 on loan to other collections from the NYZS. There were 28 species listed as endangered in some degree. Births and hatchings totaled 107.

### Prevention and treatment

The most important and least visible aspect of the department's work involves preventive medicine—surveillance, quarantine, and routine treatment. The goal, of course, is to eliminate disease, to allow animals in the Society's care to live long, productive lives. In recent years, preventive efforts have had considerable success in dealing with problems that were once prevalent, including nutritional myopathy, tetanus in monkeys, and various parasite diseases.

In 1983, the department began using a new drug called ivermectin to help control internal parasites in mammals and birds. Ivermectin proved to be safe, effective, and easy to use, since it can be disguised in a variety of foods. A number of different animals—including a polar bear, several wisent, and some slender-horned gazelles—which might have perished from parasitic diseases in past years, responded dramatically to treatment with the drug.

Cross-species blood transfusion, proved earlier to be effective in mammals, was carried over to birds in 1983. The blood of a donor chicken used for semen-freezing studies was transfused into several birds—including tragopans and Queens Carola's parotia—which had severe anemia and would certainly have died. The response of the birds was immediate, and they showed none of the expected reactions to foreign blood. In the future, the technique will be used on a broader scale, for cases that might otherwise have grave prognoses.

Two advances were made in animal immobilization, an area that still entails serious risks for some species. One involves the development of a lighter syringe (for administering drugs by blow-pipe), which seems to cause little alarm in the animals and has less potential for causing injury. The other involves the use of several new combinations of drugs that result in a higher degree of relaxation and comfort in the immobilized animals. These



Dr. Emil Dolensek observes newly-hatched touracos in the World of Birds.

drugs also facilitate physical examinations and reduce the possibility of injury to Zoo personnel.

#### **Clinical research**

In 1971, the New York Zoological Society cooperated with New York Hospital in a blood-lead survey of Zoo animals. The study revealed a high lead exposure in large felines housed in outdoor exhibits. In 1981-83, an expanded version of the research was conducted in conjunction with the Bronx Community College, on a grant from the National Institutes of Health. Fortunately, the survey of more than 600 animals—mostly hooved stock, felines, and primates—showed a minimal level of lead in each one. It is assumed that the use of lead-free fuels in most new automobiles is a significant factor in the decrease.

The Hoffmann-LaRoche Company expanded its interest in Vitamin E studies on Zoo animals by providing a grant to fund further research in endangered species. To earlier work on nyala (an African antelope), Mongolian wild horses, and Grevy's zebras will be added studies of several new species. A controlled study of the diminutive mouse deer is especially important as it may show a relationship between inbreeding depression and low serum levels of Vitamin E. Other surveys have already demonstrated low Vitamin E levels in species such as elephants and gorillas. The effectiveness of supplementation is being measured on a continuing basis, although the ultimate benefits of higher serum levels can only be determined from the animals' long-term reproductive success and longevity.

#### **Reproductive Studies Unit**

The development of reproductive data and special breeding techniques for endangered species continued on all fronts. Semen was collected from seventeen species, including Pere David deer, brow-antlered deer, proboscis monkeys, and wattled cranes. After the best method of diluting and freezing is determined for each species the semen is then stored in liquid nitrogen at  $-196^{\circ}\text{C}$  and becomes part of the department's sperm bank.

The broad range of endocrinology work, conducted at the Population Council of Rockefeller University, included a cooperative study with the National Zoo on the giant panda Ling-Ling. Last year, a rise in urinary progesterone was demonstrated late in a pregnancy that ended in stillbirth. This spring, daily urine samples were tested for estrogen to determine estrus and time of ovulation. The pandas bred at the time predicted by the hormone assay and samples were then to be evaluated for evidence

of pregnancy. By pinpointing the rise in progesterone, which indicates implantation of the embryo in the uterus wall, it may be possible to predict the time of birth.

Pregnancy has been diagnosed in one of the Zoo's rare Indian rhinoceroses. After breeding, urine samples collected by keepers were assayed for estrogen and progesterone. The results showed continuously high progesterone and low estrogen levels, indicating pregnancy. The birth is not expected until early 1985.

Two important aspects of the reproductive program involved gemsbok at the Wildlife Survival Center on St. Catherine's Island. An attempt was made to synchronize the estrous cycles of several females, and four were artificially inseminated in June 1984.

#### **Animal Health Center**

In spite of heavy spring rains, the construction of the Society's new animal hospital, the Animal Health Center, has remained close to schedule. At year's end, foundations, walls, and floors were substantially completed. Interior finishing, equipment installation, and landscaping remained to be done. The building will be dedicated in the spring of 1985, by which time it will be serving all of the Society's clinical, research, and educational functions in zoological medicine.



A laparoscopy to determine the sex of a crane is performed by Dr. Janet Stover, head of the Reproductive Studies Unit.



Each year, as the natural world diminishes, the role of zoo education becomes more critical. Zoos are virtually the only places where urban people can learn about wildlife biology, behavior, ecology, and conservation through the observation of live animals from every continent, and through educational programming deriving from this unique resource.

The Bronx Zoo Education Department is thus involved in practically every aspect of the Zoo's operations, with responsibility for the Children's Zoo, animal demonstrations in the Children's Theater and Wildlife Theater, exhibition planning and interpretive graphics, the llama and camel rides, Friends of the Zoo volunteer guides and docents, Safari Tour Train and Wild Asia monorail guided tours, educational publications in the natural sciences, and an extensive program of courses for both children and adults.

#### **Courses for organized school groups**

In the scope and diversity of its curriculum, the Bronx Zoo is now one of the major sources of wildlife education in New York City. The department's efforts to reach school administrators throughout the metropolitan area have strengthened ties with the school system and resulted in a dramatic upsurge of class enrollments. Over the past year the number of students taking classes in organized school groups rose twenty-seven percent to 14,945. General audience participants increased by sixteen percent to 2,533. With guest lecturers and a staff of six instructors, the department conducted more than 700 class sessions.

Experiencing the greatest growth were two model elementary level programs: "Animal Discovery," a series of three one-hour sessions on mammals, reptiles, and birds for grades one through six, and "Windows on Wildlife" (WOW). Since its incep-



Summer interns learn about basic biology and working with animals, as well as camel gratitude.

tion in 1978, Project WOW has served nearly 12,000 metropolitan area children in grades three through six, offering insights into endangered species and their habitats in a six- to eighteen-hour program at the Zoo. This year, applicant demand exceeded the number of classrooms available.

A new series, titled "Animals Near and Far," was created to address the needs of children in kindergarten through second grade. Live animal demonstrations, puppets, stories, music, and creative movement help to instill a special awareness of wildlife beyond the child's immediate experience. Twelve hundred children participated in this first multi-session program for early elementary school students, and nearly 1,000 have already been registered for the coming school year.

A new reservation system was initiated in the spring of 1984. The April-June period was designated for elementary school groups, and junior high and high school groups were encouraged to visit the Zoo from September through March, when exhibits can be studied at their uncrowded best. The intent of the new policy was to streamline the reservation process, to provide educational materials directly to the school systems, and to maximize the educational value of Zoo trips, and it seems to be effective in those areas.

#### **General audience programs**

For very young learners, the department introduced "Fuzzy, Furry Friends," featuring foxes and rabbits in story, song, and real life. This attracted so many participants that six new sessions were added to the two originally scheduled, to accommodate overflow registration.

At the other end of the audience spectrum, the department conducted a one-week summer seminar in "Animal Behavior" for thirty-two adults, complementing the long-established summer programs for children and teens. Members of the Elderhostel program, all senior citizens, came from as far away as California, Florida, Massachusetts, and Ohio to observe and discuss how animals act and interact in exhibitions at the Bronx Zoo.

During the academic year, several new programs for adults were taught by Bronx Zoo curators and education staff. Included were "Keep in Touch: A Focus on Animal Language"; "A Zoo Doctor Looks at the Future" with Chief Veterinarian Emil Dolensek; "Penguins: Recipe for Survival" with Associate Curator of Ornithology Christine Sheppard; "Keep 'em Wild: Mammal Exhibits at the Bronx Zoo" with General Curator James Doherty; and "Ivory Wars Update" with Dr. Archie Carr III, Assistant Director of Wildlife Conservation International.



Guided by Assistant Curator Douglas Falk, an Elderhostel group learns about sea- and shorebirds in the Harry DeJur Aviary.

### **The Zoo and the schools**

Funded initially by the National Science Foundation, the IDSE program ("Information Dissemination in Science Education") continued on a self-sustaining basis during its second year. From school districts in New York City and Greenwich, Connecticut, 130 science teachers attended three full days of Education Department workshops at the Zoo, designed to acquaint them with the Zoo as an educational resource, with a range of published classroom materials, and with approaches to teaching various wildlife subjects. This intensive training, which will continue in the 1984-85 school year, has already had a significant effect in extending the reach of the Zoo's educational efforts.

The staff also had an opportunity to address educators from across the United States at two major professional conferences: the Association for Supervision and Curriculum Development annual meeting in New York, and the National Science Teachers Association annual conference in Boston. With well over 10,000 professionals in attendance, the Education Department's exhibit of Project WIZE ("Wildlife Inquiry Through Zoo Education") had wide exposure and generated hundreds of requests for participation and information. Most of all, the Zoo's efforts in education won increased respect from the educational community.

### **Curriculum publications**

WIZE itself has progressed to the last phases in developing materials for production of the project's second module: "Survival Strategies." Module I of these curriculum materials, with major funding from the National Science Foundation, the J.N. Pew, Jr. Charitable Trust, and the Geraldine R. Dodge Foundation, have been successfully tested with 4,500 students in grades six through nine in eight states, and five more states—Hawaii, Missouri, Oregon, Colorado, and Alabama—are joining in the testing of Module II. It is hoped that a commercial publication contract can be concluded in the coming year to make these innovative materials available to zoos and middle school teachers throughout the country.

Project ZIP ("Zoo Information Packs"), eight sets of instructional materials for grades one through three and four through six, was completed in the spring of 1984. Pre-visit, in-zoo, and post-visit activities are designed to make maximum use of the Bronx Zoo's exhibitions as an educational experience and to introduce the basics of mammal, bird, reptile, and amphibian life. Funded by the William

Randolph Hearst Foundation, ZIP is available free of charge to the nearly 300,000 elementary school students who visit the Zoo each year.

### **The Children's Zoo**

A record 560,332 children and adults, representing an increase of more than 15,000 over fiscal year 1983, enjoyed the naturalistic and educational exhibits of the Children's Zoo. Sales of animal food and souvenir photographs increased even more dramatically than the number of visitors—by nearly twenty-nine percent.

### **Exhibition interpretation**

For the Bronx Zoo and the Central Park and other City Zoos, the department has begun to develop educational materials and signage for more than 100 new animal exhibits. Prominent among them are the tropical habitats of Jungle World, due to open in 1985, where textual and graphic interpretation involves identification of a great variety of animal and plant species; the installation of five galleries illustrating the diversity, mystery, and value of tropical ecosystems; and the creation of Jungle Lab, the first classroom to be designed as part of an exhibition.



Instructor Otto Gonzalez leads Zoo Campers through the World of Birds Nursery, one of many stops in the week-long summer program.

### Friends of the Zoo

On any day of the week, visitors to the Zoo can find some of the more than 200 volunteer Friends of the Zoo leading guided tours, providing interpretive services in the Children's Zoo, giving mini-talks at exhibits, and manning educational information tables. FOZ docents also help with Education Department courses and Zoo special events and answer hundreds of letters to the Zoo from school-children. To aid in this work, thanks to a grant

from the Michael Tuck Foundation, the volunteers are preparing a much-needed docent handbook.

Last year, FOZ held forty-three member's birthday parties, gave 373 tours to more than 10,000 children and adults, and presented their preview slide show to nearly 500 people. In addition, the outreach program visited 1,954 people in medical institutions with live animal demonstrations.

### Children's Zoo Census, Bronx Zoo (as of December 31, 1983)

	Families	Species and subspecies	Specimens in Zoo	Specimens owned
<b>Mammalia orders</b>				
Marsupialia—Opossum	1	1	3	3
Insectivora—Hedgehogs	1	2	4	4
Edentata—Armadillos	1	1	1	1
Lagomorpha—Rabbits	1	1	12	12
Rodentia—Mice, porcupines, etc.	4	5	13	13
Carnivora—Foxes, ferrets	4	5	18	18
Perissodactyla—Horses	1	2	4	4
Artiodactyla—Goats, sheep, camels, etc.	2	5	26	25
<b>Totals</b>	<b>15</b>	<b>22</b>	<b>81</b>	<b>80</b>
<b>Aves orders</b>				
Ciconiiformes—Hérons	2	5	11	11
Pelicaniformes—Cormorants	1	1	6	6
Anseriformes—Ducks, geese	3	4	47	47
Falconiformes—Falcons	1	1	2	2
Galliformes—Chickens	1	3	23	23
Strigiformes—Owls	2	3	7	7
Columbiformes—Doves	1	2	5	5
Psittaciformes—Parrots	1	2	2	2
Passeriformes—Mynas	1	1	1	1
<b>Totals</b>	<b>13</b>	<b>22</b>	<b>104</b>	<b>104</b>
<b>Amphibia orders</b>				
Caudata—Salamanders	3	4	10	10
Salientia—Frogs, toads	1	1	14	14
<b>Totals</b>	<b>4</b>	<b>5</b>	<b>24</b>	<b>24</b>
<b>Reptilia orders</b>				
Testudinata—Turtles	2	7	40	40
Crocodylia—Alligators	1	1	3	3
Squamata (Sauria)—Lizards	4	5	18	18
Squamata (Serpentes)—Snakes	3	9	22	22
<b>Totals</b>	<b>10</b>	<b>22</b>	<b>83</b>	<b>83</b>

**N.B.** Specimens in Zoo include 1 on loan to the NYZS from another collection. There were 14 species listed as endangered in some degree. Births and hatchings totaled 71.



### Jungle World

Teams of sculptors, painters, and other exhibit specialists, have nearly completed the tropical Asian habitats of Jungle World, the Society's largest and most ambitious indoor project to date. Designed to instill in the visitor an appreciation for the diversity, mystery, and importance of the earth's rapidly disappearing tropical ecosystems, Jungle World will re-create optimal living conditions for several endangered and rarely seen creatures. With the volcanic island and mangrove swamp exhibits now complete and densely planted, work continues on the vast rain-forest section, the five interpretive galleries that will complement the exhibits, and the unique Jungle Lab classroom within the exhibition, financed by Chase Manhattan Bank, which will allow students to observe animal behavior as though from a zoologist's hidden field station.

Jungle World has been named in honor of NYZS Trustee Enid A. Haupt, whose remarkable contribution pledge, made in June 1984, will supply the majority of funding for the exhibitions.

### Wild Asia Plaza

In early spring, construction crews began reshaping the upper portion of Wild Asia Plaza in anticipation of the larger crowds that are expected to tour Jungle World and ride the Bengali Express Monorail. New banners, brightly colored to match Buddhist robes, now fly overhead. Work also began on the rocky ledges and a spacious tentlike aviary for a large breeding colony of endangered waldrapp ibis, originally found throughout much of the Near East.

### Snow Leopard Exhibition

On a hillside near the bear exhibits, an extensive Himalayan habitat of talus slopes, alpine meadows, and dense groves of Asian rhododendrons, birch, and bamboos is being created for the Society's highly successful breeding group of snow leopards. Visitors will wander between rough boulders, under steep rock faces, over bridges spanning ravines, and between trees to view these elusive and endangered big cats in their remote montane habitat. Supported in large measure by the Society's Women's Committee, this unique project will also have secluded, off-exhibit rearing areas for as many as two dozen snow leopards.

### Elephant House

As part of the overall renovation and restoration of Zoo Court, architectural planning is now complete for the conversion of the historic beaux-arts Elephant House into a showplace for elephants and

rhinos. The building, which has been only partly used for several years, will have indoor quarters for the two species as well as interpretive displays. Under the great dome will be Zoo Center, where information about the Zoo, Aquarium, and other Society programs will be available to visitors.

Outside, the elephants' yard will be redesigned and extended into the wooded area to the east. Vantage points for visitors will be secluded and will emphasize the natural character of the exhibition. A new elephant ride will take visitors into this landscape. At the building's west end, rhinos will take mud baths and browse through tall grasses in two spacious new outdoor exhibits.

On the south side, an animal behavior theater, seating 1,000 people, will accommodate the Zoo's popular elephant demonstrations and other public events.

### Graphic design and production

The department is responsible for the design, quality control, and production of a remarkably broad spectrum of printed material and sign graphics. In the past year, graphic work has ranged from fund-



This ficus tree represents one of the more than 100 plant species that will grow in Jungle World.

raising brochures for both the Zoo and Aquarium to dramatic posters in New Guinea pidgin for the Society's bird of paradise project in that country; from full-color charts to assist U.S. Customs officials in identifying rare Amazon parrots to brochures for Society trips abroad and invitations to special events. A new portable system enabled the Society to set up graphic displays in Citibank and for legislators in Albany, and to advertise Project WIZE at educators' forums in Boston and New York.

All the Zoo's directional signage was replaced during the year. Interpretive signage was produced for several exhibitions, including the Zoo's new breeding group of pudu, a small South American deer, and the Aquarium's bizarre South Pacific green-lace scorpion fish.

#### **Horticulture Department**

Among its more than 100 genera of exotic Asian flora, Jungle World will feature fifteen types of forest canopy and flowering trees, seventeen types of palm trees, two species of prehistoric cycads, tree ferns, grasses, herbs, bamboo, and a varied collection of epiphytes, including orchids and ferns. The volcanic island and mangrove exhibits have already been planted with palms, bamboos,

Callistemon trees, and other native materials. And much of the planning and procurement for the lowland rain-forest exhibits has been completed.

The restructuring of Wild Asia Plaza involved salvaging and transplanting the collection of sturdy smoke trees, golden-rain trees, and purple beeches. A line of Japanese pagoda trees was added to provide cooling shade and August flowers. Other hardy Asian plants added include yellow-groove bamboo, ligularia, aucubas, and variegated eulalia grass.

NYZS members were responsible for two major plantings. In the fall of 1983, more than 100 members came to the Zoo on a Saturday morning to plant 10,000 daffodils, 3,000 grape hyacinths, and 4,000 crocuses. Through their skilled and hard-working effort, the Zoo blossomed in spring as never before. Also in the spring, members planted 1,000 grasses, many genera native to Africa, in the African section of the Zoo, again as part of the BIZ ("Botany in the Zoo") program.

Tree care has been improved with the application of tissue and soil injection techniques for fertilization and pest control. A new hydraulic arbor truck ("cherry-picker") facilitates pruning, removal, pest control, and other tasks of high-ranging tree maintenance.



General Director William Conway joins Curator John Gwynne and Graphic Designer Curtis Tow for a planning session.

### Jungle World

Tradesmen are working alongside artisans of the Mervin Larson Company to complete the Society's largest and most spectacular indoor exhibition for its public opening in June 1985. As masons, carpenters, plumbers, electricians, and glaziers create a functioning infrastructure for the building—the basic blockwork; plumbing for waterfalls, pools, and streams; wiring for pumps and other electrical equipment; frames for landscape elements—sculptors, painters, and other craftsmen mold, cast, carve, and paint huge trees, sheer cliffs, and hundreds of feet of vines.

Outside Jungle World and the Bengali Express, the upper area of Wild Asia Plaza is being expanded and reorganized to accommodate the heavier flow of traffic that is expected when Jungle World opens. Here the work includes installing brick walkways, adding new railings, and building an aviary, a monumental gateway, and an ornamental fountain.

### Animal Health Center

The exterior of the animal hospital structure, begun early in 1983, was virtually complete by June 30, 1984, with only the landscaping and work on some animal holding areas remaining to be done. The interior rooms were half finished: the terrazzo floors had been laid and the vents and ducts were in place. Medical equipment was scheduled to be installed by mid-fall 1984 in preparation for the Center's formal opening in spring 1985.

### Cogeneration project

After two years of feasibility studies by the Operations Department, the Government Affairs Department, and outside consultants, the Society will go ahead with plans to build a new cogeneration system to replace the aging and fragmented utility plant of the Bronx Zoo. The appropriate approvals from Federal, State, and City agencies were obtained, and final engineering designs were to be started.

The new system will centralize production of energy at the Zoo in a single cogenerating plant which will supply 100 percent of the Zoo's electrical needs. Through the process of cogeneration, the excess heat produced by the generators will be used to heat and cool about seventy percent of the Zoo's buildings. This modernization, by conserving energy, will substantially reduce the cost of fuel to both the City and the Society.

### Zoo improvements and maintenance

The City of New York undertook a comprehensive

program of Zoo-wide improvements. Repaving most of the deteriorating roads and paths was scheduled for completion in July. Park benches were repaired and unsightly old fences were to be replaced with more naturalistic looking ones.

Other improvements at the Zoo included the installation of a new boiler at the Great Ape House; the reroofing of eight Zoo service buildings; painting the interiors of four exhibition buildings; and rebuilding the truck scale where the riding elephants are weighed each year.

Several important pieces of maintenance equipment were acquired to replace aging vehicles, including a refuse truck, an articulated wheeled loader, a dump truck with snow plow and sand spreader, and battery-powered cargo carriers that are more efficient and maneuverable than the old pickup trucks.



This white-handed gibbon, born on September 18, 1983, will live with its family in the rain-forest section of Jungle World.







### Record crowds, new exhibits

Over the past year, for the first time since 1976, more than a half million people came to the Aquarium. Along with such old favorites as beluga whales, sharks, and penguins, visitors were treated to new exhibits of some rarely seen creatures.

A green-lace scorpionfish, for instance, was shown for the first time in the western hemisphere. Collected by NYZS Trustee Nixon Griffis and Aquarium Senior Keeper Eddie Dols near Papua New Guinea, this strangely beautiful, venomous fish was put on view in August 1983. Since its discovery in 1980, only ten specimens have been seen and only one has been shown in an aquarium, where it survived for a month.

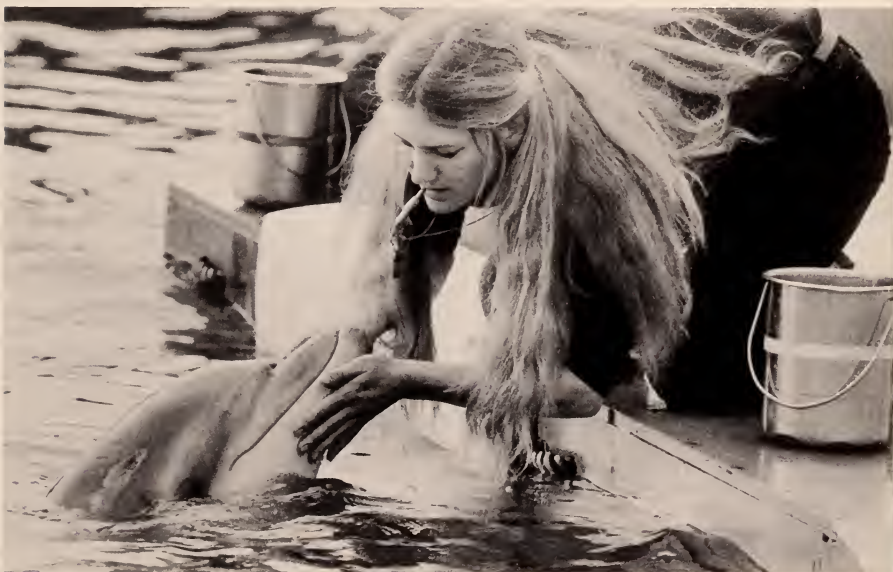
Alaskan king crabs and giant spider crabs of Japan are now part of the Creatures of the Deep Cove. The latter, a gift from the Himeji Aquarium in Japan, are members of a species that boasts the largest crabs in the world. Specimens have been known to reach twelve feet with claws outstretched. Though the two on exhibit at the Aquarium now measure only four feet across, they are nevertheless quite formidable looking.

### Dolphin and pinniped arrivals

Five new bottle-nosed dolphins were added to the Aquarium collection. Two of them, Shilo and Jetty, arrived in September and wintered under the dome of the Marine Mammal Holding Facility. Under the guidance of an expanded training program, they now perform several times each day. The other three animals, Mimi, Lily, and Starkey, arrived from the Florida Keys in June to be trained and housed permanently at the Aquarium.

Four California sea lions, a gift of the Long Island Game Farm, were assigned to various locations, according to their needs. Seaweed and Jaws joined Aquarium regulars Breezy and Gigi in the performance schedule, in alternating shows. Salty was put on exhibit at the Aquarium, and Pandora joined the six sea lions at the Bronx Zoo.

Animals come to the Aquarium in a variety of ways—from collecting trips, as gifts from other institutions, through breeding trades, and through rescue operations of the Marine Mammal Stranding Network. The most rewarding method, however, is by birth or hatching, and this year the most exciting such arrival—on Father's Day, June 16, 1984—



Dolphin shows at the Aquarium have been expanded under the direction of Animal Trainer Alysoun Seacat.

was that of Lucile, a baby harbor seal born on exhibition to Patches, sired by Corky. Lucile is the first harbor seal born at the Aquarium since 1976.

#### Capital projects

Preliminary planning for Discovery Cove, a major exhibition and education facility designed especially to exploit the dynamics of family learning, has been completed. Models have been prepared and the design of interior exhibits is well under way. An environmental classroom behind the scenes will give the Education Department a versatile, much-needed space near Aquarium exhibitions. And the entire complex, with its rich interplay of participatory, living, ecological, dioramic, photographic, and interpretive exhibits, will expand educational programs for families and school groups and intensify the visiting experience of the general public.

Sea Cliffs is the working title for an exhibition that will be devoted to marine mammals and birds. By renovating the existing black-footed penguin rookery and the tripool for pinnipeds, and by adding a connecting pool between them, a complex of rocky coastline exhibits will be created. With both above- and below-water viewing areas, visitors will be able to observe the myriad behaviors of harbor and gray seals, walruses, penguins, and sea otters. A series of alcoves in the below-water viewing area will include interpretive graphics and related exhibits of prey specimens and other marine organisms found in these rocky coastal environments.



This intricately camouflaged green-lace scorpionfish, collected for the Aquarium by Society Trustee Nixon Griffis, is one of only ten that have been sighted.

Also planned is a new Aquarium facade, which will better define a queuing area for visitors and school groups, while new entrance doors and ticket booths will facilitate the flow of visitor traffic into the Aquarium foyer. There, new graphics and feeding and show schedules will help people plan their visit. Improved lighting and a weather-protected tension structure will make the Aquarium entryway more comfortable for the public.

Most important to the Aquarium's living collections is the planned new seawater intake system, which will provide a constant and uninterrupted flow of natural seawater at the rate of 1,500 gallons per minute. This simple, efficient system is being designed to eliminate clogging problems that result in reduced water flow rates.

#### Aquarium Education

Family learning, the operative concept in the planning of Discovery Cove, continued to play an important role in Aquarium courses. An innovative series of weekend classes and workshops, called "Beneath Noah's Ark," was added to the multigenerational programming that has been offered since 1972. Stressing participatory activities, this new curriculum covers such subjects as aquatic animal medicine, marine research, breeding, animal communication, ecology, conservation, and the vital link between people and the sea. With participants ranging from toddlers to teenagers to adults, the program is designed to encourage communication among various age levels. Career counseling and hands-on contact with animals and artifacts, as well as access to research laboratories, are some of the ways in which the Aquarium's and Osborn Laboratories' resources are used in this program.

In fiscal 1984, the Aquarium Education Department was able to reach larger school, community, and family audiences than ever before: 21,696 schoolchildren in 550 groups from preschool to the university level, and 3,111 family members attended revenue-producing sessions. Thirty-nine programs were offered on such varied topics as "Whale Communication," "Animal Husbandry and Aquarium Maintenance," "Aquatic Ecology," and "Salt Marsh Conservation." Special "Save Energy" programs, sponsored by Con Edison, were offered to 2,100 students during the winter months.

Docents for the busy summer months, recruited from local high schools with marine science programs and trained in an intensive week-long course, numbered thirty-nine in 1983. These dedicated students, working largely with family

groups, offered presentations to more than 146,000 visitors. The program, available seven days a week, was coordinated for the fifth year by an intern, last year from City College, sponsored by the Exxon Corporation. The Education Department

was also assisted by three student interns, from Columbia University Teachers College, Kings Borough Community College, and the City as School and Training Opportunity Program.

**New York Aquarium Census (as of June 30, 1984)**

Phylums	Classes	Orders	Species	Specimens
Chordata	Chondrichthyes—Cartilaginous fishes: Sharks, rays, chimeras	Heterodontiformes—Horn sharks	1	6
		Squaliformes—Typical sharks: Sand tigers, lemons	6	19
	Osteichthyes—Bony fishes	Rajiformes—Rays	3	7
		Acipenseriformes—Sturgeon, paddlefish	1	13
		Amiiformes—Bowfin	1	4
		Elopiformes—Tarpon, bonefish	1	1
		Anguilliformes—Eels, morays	5	9
		Salmoniformes—Trouts	2	17
		Cypriniformes—Minnows, carp	3	200
		Siluriformes—Freshwater catfishes	1	2
		Batrachoidiformes—Toadfishes	1	23
		Gadiformes—Codfishes	2	2
		Atheriniformes—Platys, swordtails, killifish	30	380
		Beryciformes—Squirrelfishes	2	12
		Gasterosteiformes—Seahorses, pipefish	2	23
		Perciformes—Perches, sea basses, porgies, cichlids	150	700
		Pleuronectiformes—Flatfishes	5	25
		Tetraodontiformes—Puffers, boxfish, triggerfish	8	30
		Osteoglossiformes—Arapaima	1	5
		Family:		
		Protopteridae—African lungfish	1	1
	Reptilia	Chelonia—Turtles	11	46
	Aves	Sphenisciformes—Penguins	1	44
	Mammalia	Pinnipedia—Seals, sea lions	4	15
		Cetacea—Whales, dolphins	2	10
Cnidaria	Anthozoa—Corals, anemones		30 ±	19,000 ±
Annelida	Polychaeta—Marine worms		3	20
Arthropoda	Crustacea—Lobsters, shrimps, crabs, isopods		12	100
	Arachnida—Horseshoe crabs		1	25
Mollusca	Gastropoda—Snails		1	100
	Pelecypoda—Bi-valves		2	14
	Cephalopoda—Octopus, nautilus		3	36
Echino-dermata	Asteroidea—Starfish		9	60
	Holothuroidea—Sea cucumbers		3	15
	Echinoidea—Sea urchins		3	100
<b>Totals</b>			<b>311 ±</b>	<b>21,064 ±</b>

### Fish genetics

Two experiments have been the focus of work in the genetics lab under the direction of Dr. Klaus Kallman. One involves the transplantation of pituitary glands in platyfish to determine the primary site of action of the *P*-gene, which controls the onset of sexual maturation. To be determined is whether the *P*-gene acts directly on the pituitary gland or indirectly through the hypothalamus.

Other experiments have been designed to establish a system of genetic identification for platyfish (*X. helleri*) by means of the color pigments effecting the swordlike extensions of their caudal fins. Dr. Kallman has been studying the inheritance of yellow, orange, green, and other pigments, while Dr. Isaac Bao, a Jessie Smith Noyes postdoctoral research fellow, has identified the chemical pigments responsible for color differences in a large variety of *X. helleri* strains by means of chromatography.

### Pathology

Some years ago, rainbow trout raised in hatcheries throughout the world developed liver cell carcinoma (hepatomas). Along with other scientists, Dr. Ross F. Nigrelli, who was then director of the Osborn Labs, studied these hepatomas and found the causative agent to be a toxin, called aflatoxin, produced by a mold in rancid oil used in trout feed. Aflatoxin is one of the most potent known carcinogens.

Aflatoxin research continues today, with current studies focusing on the susceptibility of species other than trout to hepatomas. It is suspected that aflatoxin will not readily induce hepatomas in other fish, and that trout have a genetic predisposition to this disease. Hepatomas are prevalent among certain native African people (Bantus and others), who consume large amounts of moldy corn or peanuts containing aflatoxin, and these experiments could be important in helping us to understand the cause and development of this cancer in humans.

Under the direction of Dr. Paul Cheung, other pathology projects include work on fungi and parasites. Three parasitic fungi were studied by Dr. Joseph Gaskin, another Jessie Smith Noyes postdoctoral research fellow. These agents were isolated from the skin lesion of a smooth dogfish born in the shark exhibit at the New York Aquarium, the spleen and kidney of an oyster toadfish, and the kidney of a coral catfish. Dr. Gaskin was able to study the morphological characteristics of the fungi and to examine their ultrastructures by using

transmitted and scanning electron microscopic techniques.

Routine necropsy on all fish that died in the Aquarium exhibits during the past year revealed several new parasites. They are: (1) monogenetic trematodes from the skin of the Galapagos shark, *Carcharhinus galapagensis*; (2) *Unicapsula* and *Sep-tecapsula* species of Myxosporeans from the gill and cranial fluid, respectively, of a coral catfish; (3) coccidia from the visceral surface of the cownose stingray; and (4) heart worms, *Philometra saltatrix*, from the pericardial cavity of O-class blue snappers. The morphological characteristics of these parasites are currently being studied with a view to developing effective agents for eliminating them.

### Fouling organisms

Dr. Betty Borowsky's work has revealed new data on the physiology and reproductive patterns of *Jassa falcata*, a shrimplike crustacean that fouls the submerged surfaces of ships by building residential tubes on them. Usually, the hardened tubes must be scraped off, so investigations of the species' life history might prove helpful in developing less costly and labor-intensive methods of eradication.

Dr. Borowsky has discovered that females build better tubes than males, and that they release a chemical which attracts males. For their part, certain types of males travel to females more successfully than others. With further understanding of these characteristics, it may become possible to interfere with the animals' reproductive cycle and hence to inhibit the fouling process. Such biological controls would pose no threat to the environment.

### Chambered nautilus

In his detailed studies of the chambered nautilus, Dr. John Chamberlain, Jr., has learned that this beautifully coiled shellfish of the western Pacific and Indian oceans increases or reduces the amount of gas in some chambers of its shell in order to trim its buoyancy and to offset weight gains or losses resulting from its daily activities. Using a machine which forces water across the siphuncular tube and then isolating specific portions of this tube for analysis, Dr. Chamberlain demonstrated that transport occurs throughout the length of the tube. This conclusion has important paleobiological implications because it means that siphuncle geometry can be used as a basis for inferring some aspects of the characteristics of fossil cephalopods related to nautilus.



### Central Park Zoo

The official groundbreaking for the new Central Park Zoo took place on February 10, 1983. After speeches by Mayor Edward I. Koch, Parks Commissioner Henry Stern, Manhattan Borough President Andrew Stein, Comptroller Harrison Goldin, NYZS President Howard Phipps, Jr., and City Zoos Project Director Richard Lattis, all donned hard hats and dug a ceremonial shovelful of earth.

All structures designated for demolition are now gone. Only the Monkey House, which will become the Heckscher Zoo School; the Bird House, planned as the future sales shop and gallery; and the garage, to be renovated for use as an animal kitchen, shop, and maintenance facility, remain.

Looking westward from the sea lion pool in the Central Garden, the view is now unobstructed by buildings. This opening of the park and the creation of a garden-like setting will continue to be an integral part of the design, even after the new exhibition buildings and visitor arcades have been built.



Central Park Zoo groundbreaking by NYZS Director of the City Zoos Project Richard Lattis, NYZS President Howard Phipps, Jr., Comptroller Harrison Goldin, Mayor Edward Koch, Commissioner of Parks and Recreation Henry Stern, Manhattan Borough President Andrew Stein, and City Councilman Robert Dryfoos.

With demolition complete, contractors should be chosen and construction begun by fall of 1984.

### Flushing Meadows Zoo

The schematic design for the new Flushing Meadows Zoo in Queens is complete, and drawings and a scale model of the proposed zoo have been reviewed by the Department of Parks and Recreation and several other City officials and agencies. The creation of construction drawings should take about eighteen months.

All existing animal facilities will be totally renovated, and there will be new exhibits for cougars, bobcats, prairie dogs, snakes, wildlife of the marsh, and many species of birds, as well as a totally new children's farm. The new zoo will offer the visitor a chance to hike through North America—along the seacoast, across the prairie, and into the deserts and woodlands. Expansion of the administrative service and cafeteria facilities is also planned.

### Prospect Park Zoo

Schematic designs for Brooklyn's new children's zoo in Prospect Park are also complete. A colorful scale model was presented to the Department of Parks and Recreation, along with five design proposals of varying cost and complexity.

The selected plan retains the sea lion pool, which will be expanded, and includes a large naturalistic outdoor exhibit for baboons. Both are certain to delight adults as well as children. Other outdoor exhibits, for mountain lions, wallabies, emus, several species of birds, and underwater views of marsh life, will tie in with spacious indoor habitats in the "World of Animals" thematic zone.

Another zone, "Animals in Our Lives," will have over thirty indoor animal exhibits, showing everything from tiny insects to household pets, but concentrating primarily on animals whose behavior or beauty has led to a close association with humans. Outdoors will be familiar domestic animals which can be petted and fed.

The baboon habitat will be part of the "Animal Lifestyles" zone and will relate to the new exhibits planned for the renovated old elephant house. A number of educational participatory devices will enhance the visitor experience both indoors and out throughout the Zoo. Here again, work on construction drawings is about to begin, and will take about eighteen months.



### Ecology and economy—common interests

In May 1984, Pope John Paul II blessed the proud and decorous highlanders of Papua New Guinea in a televised ceremony seen throughout the world. Featured in the Papuans' finery were colorful and iridescent feathers from birds of paradise, about forty species of which live only in New Guinea and islands nearby. The prominence of these adornments reflected a oneness with nature that should, in some sense, be a focus of our own western concern with preserving the natural world.

The highlander's relationship with birds of paradise has been particularly well documented by Gillian Gillison and her photographer-husband David in Ugaigubi, one of three villages distributed across the cloud forest slopes of Crater Mountain. (A popular account of their work can be found in the August 1983 issue of *National Geographic*.) Drawing heavily on the anthropological background compiled by the Gillisons, Wildlife Conservation International subsequently began a project to establish a 3,000-square-kilometer reserve on Crater Mountain to protect the way of life of the Gimi-speaking villagers, to preserve their forest, and to provide for the conservation of fully half of all known bird of paradise species.

Development of the park to benefit people as well as wildlife will demand the wholehearted cooperation of the ecologist and the economist. This conservation area—perhaps the largest in Papua New Guinea—will provide income for the people from tourism, protection of their farming lands, maintenance of the diverse living resources employed or consumed in their daily lives, and preservation of the revered birds of paradise, in which the villagers entrust the spirits of their ancestors. The Crater Mountain project embodies what is new in conservation. It acts on an urgent priority set by WCI scientists for the remainder of this century: the application of ecology to the plight of humanity.

In Zambia, Dr. Dale Lewis, now in his third year under WCI sponsorship, has extended his detailed studies of elephant ecology beyond the boundaries of the Luangwa National Park to the drainage basin of the Luangwa River. The farmers, cattle raisers, and entrepreneurs there, equipped with a little technology, threaten the park and the wildlife. Equally, they threaten themselves as they exhaust their natural resource base and forfeit their futures.

Having quantitatively measured the tolerance of Luangwa vegetation to grazing by elephants, flooding, and burning, and having become acquainted with various forms of land use, Dr. Lewis has persuaded government authorities, tribal chieftains,

and local farmers to explore alternative approaches to economic development—approaches that promise stability—for the parks and the people.

### Staff projects in Africa

Ecology and economic development have also been linked for many years in the work of WCI Resource Ecologist Dr. David Western. His monitoring of grassland vegetation, grazing wildlife, and Masai herdsman, chiefly focused on the Amboseli National Park and its adjoining ecosystem, has been crucial to maintaining a traditional Masai cattle production system. This pastoral system, Western has found, is ideal for arid East Africa. It yields a wealth of beef and, unlike fenced ranching, allows for grazing migratory wildlife. Recently, it was proposed that some of Western's recommendations from Amboseli be applied to a brewing man-land



Research Fellow Dee Boersma conducts WCI's Magellanic penguin project at Punta Tombo, Argentina.



crisis in and around the vast Masai Mara Reserve, the most lush of Kenya's wildlife parks.

For fourteen years in the Kibale Forest of Western Uganda, Research Zoologist Dr. Tom Struhsaker has studied the biology of tropical forest primates. This research has led to an intimate knowledge of the forest ecosystem, and now, with the host country eager to restore its once-rich and productive agricultural system, its national parks and tourist trade, ecological data are critical. For this reason, both CARE and the Conservation for Development Center of the International Union for the Conservation of Nature (IUCN) have approached Dr. Struhsaker to help devise plans and programs for economic recovery.

These projects in Papua New Guinea, Kenya, and Uganda, among the thirty-five conducted at year's end by WCI scientists in twenty-three countries, represent the slow but perceptible changes being made in development patterns, particularly in third-world nations. Too much desertification has occurred, too much flooding after deforestation, too much famine and human misery because of ecological myopia. Finally, it may be recognized that conservation and biological understanding are essential to human survival, let alone economic prosperity.

#### **Giant Panda Project**

Dr. George Schaller, Director of WCI, began his third year of studies in China on the giant panda. In early 1984 he shifted his field base to Tangjiahe Natural Reserve, one of a handful of mountainous panda refuges. Work initiated earlier at the Wolong Reserve has been assumed by Ken Johnson, an American zoologist from the University of Tennessee, recruited this year to assist Dr. Schaller.

These studies, sponsored by World Wildlife International and conducted jointly with Chinese scientists, are providing an ever clearer picture of pandas' dependency on bamboo for food, their reproductive behavior, and their numbers in various reserves. Unfortunately, the already reduced populations of these compelling creatures are facing a devastating blow, at least in some of the reserves in which the 1,000 pandas are scattered. A die-off of bamboo, the only natural food pandas thrive on, has begun.

The die-off is a cyclically recurring event. Every half-century or so a species of bamboo will bloom en masse. After seeds are set and dispersed, the adult plants die. Three or four years must pass before bamboo is suitable for panda foraging.

Schaller and his associates have already been drawn into rescue planning, and it is hoped that the worst effects of the die-off can be avoided.

#### **Jaguar studies**

Major advances were made by WCI scientists on big cats of the American tropics. The field phase of the study in the wet Pantanal region of Brazil, which involved seven radio-collared jaguars, is now complete, and principal investigator Dr. Howard Quigley has begun to analyze his findings. At the remote Cocha Cashu field station in Peru's Manu National Park, Dr. Louise Emmons, under the direction of Dr. John Terborgh of Princeton University, has spent twelve continuous months using biotelemetry to monitor seven ocelots and one jaguar in the pristine Amazonian rain forest. And in the rugged Cockscomb Basin of Belize, Dr. Alan Rabinowitz entered his second year of jaguar research. Seven animals have been radio-collared and the forested basin is being considered by the Belize government for protected-area status.



Preservation of the world's smallest mammal, the endangered Kitti's hog-nose bat, is an important project in Thailand.



When these forest cat studies are complete in another year or two, a detailed and comprehensive natural history of the jaguar will at last be available. The research is distributed over thirty degrees of latitude and will include data from four distinct tropical habitats. Observations of jaguar-cattle conflicts in two countries will result in recommendations on methods to minimize this threat to jaguar survival and livestock production.

#### **Birds of South America**

Field projects ranged from the high Andes of Chile to coastal Patagonia. Dr. Stuart Strahl completed his definitive work in Venezuela on the remarkable leaf-eating hoatzin, which displays vestigial claws in early life. This study has led to a doctoral degree for Strahl, who is currently developing two new studies; one on the rare, cave-roosting oilbird and another on the Cracidae, a family of large turkey-like forest birds, including guans and curassows.

In Peru's Manu National Park, Dr. Charles Munn is investigating macaws as seed predators and seed dispersers for rain-forest trees. This work is akin to other recent WCI studies in Costa Rica, Papua New Guinea, Indonesia, and Uganda, all of which contribute to a better understanding of how the complex rain forest functions.

On the coast of Peru, Coppelia Hays continued her monitoring of the endangered Humboldt penguin. Already diminished in numbers and disturbed in their nesting sites by the activities of guano miners, the Humboldts recently suffered further setbacks due to the vagaries of the El Nino current. The anomalous gyrations of this ocean "river" of warm seawater dramatically altered the availability of fish schools, the normal prey of the penguins. High mortality of hatchling birds resulted. Fortunately, Hays not only was able to monitor the decline, but can now observe the recovery of the population. Her account of the penguins' response to a rare and devastating natural phenomena should be invaluable for future management of the Humboldt. Hays also joined forces with WCI scientist Patricia Majluf, who is studying the southern fur seal in Peru, to seek Peruvian government protection for Punta San Juan, the common breeding site for both Humboldt penguins and fur seals.

In Chile, just south of Peru, but a world away in terms of climate and altitude, is Surire Salt Lake, home of 11,000 flamingos of three species. The shallow saline lake and surrounding terrain are protected under Chilean law. Last year, government officials sought and received assistance from WCI to develop a data base and conservation program for the rare flamingos. Guided by NYZS Associate Curator of Mammalogy Mark MacNamara,

the project is now expanding to include long overdue studies of the Andean altiplano, that treeless region above 12,000 feet so stressed by drought and cold temperatures that only hearty, highly specialized plants and animals can survive—alongside remarkable, barrel-chested people. Why three of the world's six flamingo species evolved to thrive in this unforgiving environment remains a mystery to scientists.

Another WCI bird project, the Magellanic penguin study in Punta Tombo, Argentina, was the cover story subject in the March 1984 issue of *LIFE* magazine. The research, conducted by Dr. Dee Boersma, required the banding of some 8,000 birds in 1983 and '84 from a total population of nearly 1,000,000, a task that was carried out this year with the help of teams of NYZS volunteers. The voluminous data is being processed with a computer powered by the battery of an old pickup truck.

The penguin project is a major element in an Argentine conservation campaign that has been quietly sustained by NYZS General Director William Conway for more than twenty years. Dr. Boersma's findings are crucial to the management of the Punta Tombo refuge itself and to the protection of the penguins from periodic proposals to exploit them for oil, generic meat products, or ladies' gloves.

#### **Black-footed ferret**

A small team led by Dr. Tim Clark continues to monitor the single known population of ferrets near Meeteetse, Wyoming, and is surveying elsewhere in the original range of the species for additional relict colonies. A second phase in the ferret work began last year—planning for recovery through captive breeding. This part of the project will draw upon the knowledge and skills of NYZS personnel in captive animal management. General Curator James Doherty is contributing to the design of ferret breeding facilities.

In the ferret project and every other WCI project around the world, a broad range of skills and knowledge is brought to bear on problems facing single species and entire ecosystems. The New York Zoological Society is unique among conservation organizations in its ability to draw upon the expertise and participation of field biologists, animal curators, veterinarians, educators, and other specialists in the development of wildlife management, captive breeding, research, and education programs. Backing their efforts are the facilities of the Bronx Zoo, the New York Aquarium, the Osborn Laboratories of Marine Sciences, and the Wildlife Survival Center, directed by the Society's historic commitment to conservation.

# Africa

- 1 Environmental education James Connor  
*East Africa*
- 2 Ecology of the mountain nyala in Bale Mountain National Park Chris Hillman  
*Ethiopia*
- 3 Zoological monitoring in Amboseli National Park David Western  
*Kenya*
- 4 Support for African Elephant and Rhino Specialist Group (AERSC) David Western  
*Kenya*
- 5 Capital improvements in Amboseli National Park Government of  
*Kenya*
- 6 Elephant social behavior in Amboseli National Park Cynthia Moss  
*Kenya*
- 7 Marine conservation Beryl Kendall  
*Kenya*
- 8 Impact of Maasai pastoralism on vegetation of the Mara region Richard Lamprey  
*Kenya*
- 9 Academic support, Sudanese student John Awang-Awok  
Mweka College  
*Kenya*
- 10 Forest designation and conservation John Oates  
*Sierra Leone*
- 11 Ecology of the migratory white-eared kob in the Boma region John Fryxell &  
A.R.E. Sinclair  
*Sudan*
- 12 Education through the African Wildlife Leadership Foundation Sandra Price &  
Tony Potterton  
*Sudan*
- 13 Monitoring the Serengeti wildebeest population A.R.E. Sinclair  
*Tanzania*
- 14 The Kibale Forest Project Thomas Struhsaker  
*Uganda*
- 15 Human encroachment in forest reserves Karl G.  
Van Orsdel  
*Uganda*
- 16 Forest surveys Thomas Butynski  
*Uganda*
- 17 Elephant management in Luangwa Valley Dale M. Lewis  
*Zambia*

# Asia and Oceania

- 18 Status survey of freshwater turtles in northeast Asia Edward O. Moll  
*India*
- 19 Snow leopard survey and research Rodney Jackson  
*Nepal*
- 20 Fish ecology David Edds  
*Nepal*
- 21 Establishment of provincial park at Ubaigubi for birds of paradise David &  
Gillian Gillison  
*Papua New Guinea*

- 22 Behavior and ecology of montane birds of paradise and Macgregor's bowerbird Melinda &  
Stephen  
Pruett-Jones  
*Papua New Guinea*
- 23 Giant Panda Project George B. Schaller  
*People's Republic of China*
- 24 Ecological factors affecting the black shama's decline Perla Magsalay  
*The Philippines*
- 25 Conservation education and field training R. Rudran  
*Sri Lanka & Indonesia*
- 26 Biological needs of hornbills at Kao Iai National Park Pilai Poonswad  
*Thailand*
- 27 White-handed gibbon study Uthai Treesucon  
*Thailand*
- 28 Kitti's bat survey Merlin Tuttle &  
Surapon Duangkhae  
*Thailand*
- 29 Seabird conservation, Hawaii Jonathan R. Reed  
Jack P. Hailman  
*USA*





- 30 Humpback whale studies, Hawaii Deborah Glockner-Ferrari & Mark Ferrari USA

#### Central America and the Caribbean

- 31 The Cat Island turtle Perran Ross *The Bahamas*  
 32 Comprehensive planning Archie Carr, III *Belize*  
 33 Coral Barrier Reef conservation Archie Carr, III *Belize*  
 34 Jaguar survey Alan Rabinowitz *Belize*  
 35 Crocodile survey C.L. Abercrombie *Belize*  
 36 Interpretation and environmental education, Costa Rican National Park Service Mario Boza *Costa Rica*  
 37 Ecology and conservation of the tapir Keith D. Williams *Costa Rica*  
 38 American crocodile study John B. Thorbiarnson *Haiti*

#### North America

- 39 The cahow and other endangered fauna David Wingate *Bermuda*  
 40 Black-footed ferret, Wyoming Tim W. Clark *USA*  
 41 Red-bellied turtle conservation, Massachusetts Terry Graham *USA*

#### South America

- 42 The Magellanic penguin at Punta Tombo Dee Boersma & William Conway *Argentina*  
 43 Orca research and publication Juan-Carlos Lopez *Argentina*  
 44 Marine mammal workshop Hugo P. Castello *Argentina*  
 45 Spectacled bear Bernard Peyton *Argentina*  
 46 Bolivian bird recovery Donald Bruning *Bolivia*  
 47 Jaguars of the Pantanal Howard Quigley *Brazil*

- 48 Flamingo conservation Ivan Castro & Mark MacNamara *Chile*  
 49 Pudu and huemul in the Andes Mark MacNamara *Chile & Argentina*  
 50 Primates of the Apaporis River Basin Thomas Defler *Colombia*  
 51 Humboldt penguins Coppelia Hays & Donald Bruning *Peru*  
 52 Predator-prey relations in neotropical forest mammals John Terborgh & Louise Emmons *Peru*  
 53 South American fur seal Patricia Majluf *Peru*  
 54 Ecology of Amazon parrots Charles Munn *Peru*  
 55 The hoatzin Stuart Strahl *Venezuela*





With an unprecedented number of projects being planned or underway at the Bronx Zoo, the three City zoos, and the New York Aquarium, the activities of the Public Affairs Department have intensified over the year. Support for capital purposes and for Wildlife Conservation International led the way as last year's contributions from the Society's 45,000 members and donors doubled to a record of \$14,608,170. New levels were also attained in membership development and in disseminating the Society's message through advertising, public relations, and special events.

### Capital funds

Funding for capital projects reached a record of \$7,974,885, doubling last year's total. The largest share, highlighted by Mrs. Enid A. Haupt's \$3,000,000 gift, was earmarked for the habitat exhibitions and interpretive galleries of Jungle World, which is due to open in spring 1985. This exciting project also elicited the largest corporate donations the Society has ever received: \$100,000 from Exxon Corporation and \$110,000 for the Jungle Lab exhibition classroom from Chase Manhattan Bank.

Meanwhile, funding was completed for the Animal Health Center, and construction itself neared completion. The direct-mail campaign begun in 1983 was crucial to this effort, and another such campaign was launched in 1984 to help fund the Snow Leopard Exhibition, which also received more than \$300,000 from the NYZS Women's Committee and other donors. Other significant private capital contributions included \$1,000,000 from Honorary Chairman of the Board of Trustees Laurance S. Rockefeller, to be split equally between the Central Park Zoo and Discovery Cove at the Aquarium; \$1,345,000 from the late Lila Acheson Wallace and foundations associated with her for the Central Park Zoo; \$1,000,000 from President Howard Phipps, Jr., for unrestricted use; and \$500,000 from the Heckscher Foundation for the Zoo School at the Central Park Zoo.

Plans were being formulated to begin fund-raising for Sea Cliffs at the Aquarium; for a new system of cogeneration and district heating at the Bronx Zoo; and for the renovation and restoration of Zoo Court, beginning with the Elephant House.

### Budgetary funds

The Society received \$2,789,562 in contributions for current budgetary purposes, an increase of fourteen percent over fiscal 1983.

Working under the Development Committee and other volunteer committees, the development staff

raised \$1,281,371 from private foundations, \$868,905 from individuals, and \$639,286 from corporations. Endowment was increased by \$2,600,971, including funds donated to two new programs: the William Beebe Fellows and the Animal Health Fund. Net proceeds from fund-raising benefits totaled \$131,111, and \$114,394 was given in bequests to the Society.

Trustees Arthur Hauspurg and Peter Huang continued in their roles as co-chairmen of the Society's Business Committee. Gifts were received from 122 corporate donors, and a new initiative was begun to expand the gifts-in-kind program.

A total of 122 private foundations contributed to the Society's work. Among other achievements, foundation support provided a full year's funding for the work of the Reproductive Studies Unit of the Animal Health Department.

In its third year, the Annual Patrons campaign, co-chaired by John Chancellor and John Pierrepont, recruited 241 \$1,000 members, a twenty percent increase over the previous year. This program has been responsible for raising over \$600,000 for the operating purposes of the Society.

Sixty-five meetings, luncheons, special tours, and briefing sessions were managed by Guest Services through the Development Office during the year, bringing more than 5,000 people to the Zoo, Aquarium, and special lectures. The Women's Committee operated several fund-raising events, including an auction at Christie's. The Committee has already begun the planning for next year's events, including a special benefit featuring Bob Hope.

The Aquarium and Osborn Laboratories Planning Committee raised \$376,000 in support of these facilities. This is an increase of ninety-three percent over giving in fiscal 1983 and reflects the steady growth and renewal of the exhibition and scientific facilities at Coney Island.

In order to explore the potential of funding from a relatively new source, the Board of Trustees approved a proposal to implement a planned-giving program for the Society. This program will focus first on the acquisition of bequests to strengthen the Society's endowment and therefore its fiscal stability.

### Conservation funds

The development campaign for the Society's international conservation program—Wildlife Conservation International—made great strides toward increasing its base of support.

Under the guidance of the Interim Conservation Committee, gifts totaling \$3,251,000 were received for both operating purposes and endowment, including \$70,000 from corporations, \$1,556,000 from foundations, and \$1,625,000 from individuals. The well-established direct-mail effort continued to expand WCI's national constituency, with a response from 15,000 donors.

Long-term funding was bolstered by two major developments. The William Beebe Fellows endowment program was inaugurated at a dinner in October 1983, when Dr. George Schaller, Director of Wildlife Conservation International, was installed as the first Honorary Fellow. By the end of the year, twelve concerned individuals had enrolled in this important program. A month later, Mrs. Gerrit P. Van de Bovenkamp established a special fund through the Armand G. Erpf Fund in support of the Society's conservation program and especially the work of Dr. Schaller. A major gift from Mrs. James Walter Carter completed funding for the Chair of Conservation Biology, now held by Dr. David

Western, and established endowment for a Chair of Rainforest Biology, to be held by Dr. Thomas Struhsaker.

#### **Membership**

At the close of the 1983-84 fiscal year, membership in the Zoological Society was 26,350. Revenues in excess of \$997,226 reflected substantial increases in membership support in the Family and Sustaining categories, as well as a twenty-five percent gain in enrollments in the \$100-and-over contributing categories.

The \$135,000 increase in revenue is also attributable to the success of the annual direct-mail campaign, in-Zoo membership promotion, and other related enrollment efforts, which resulted in the addition of 5,741 new members.

More than 17,500 members and their guests—a record number—participated in such special events as Members' Evenings, the Garden Party, and the Annual Meeting.



Members planted fountain grass as part of the annual spring clean-up at the Zoo.

#### Public Relations, Advertising, and Special Events

Efforts to convey the Society's message of conservation and education to the public and the philanthropic community were rewarded with prominent and consistent attention by the media. National print coverage was highlighted by a *LIFE* magazine cover story on the Society's Magellanic penguin field project in Punta Tombo, Argentina. *The New Yorker* published five Society-related articles, including one on the Annual Meeting and another on the Aquarium's acquisition of two species of giant crabs from Japan. The Animal Health Department's work in reproductive biology was featured on the PBS television program "Innovations." "Zoo 2000," a five-part British Broadcasting Company production, was filmed, in part, at the Bronx Zoo. Other important stories appeared in *The Wall Street Journal*, *GEO*, *Omni*, *Epoca*, and on Cable News Network, ABC's "World News Tonight," and "The CBS Morning News." During the year, nearly 1,000 interviews were given by Society staff members, and over 400 television crews and journalists visited the Zoo and Aquarium.

"The New Bronx Zoo" advertising slogan has become well established in all print, radio, and television campaigns. It is one of the messages on 1,500 taxi-top displays, sponsored by the Philip Morris Company, which also includes a "formal invitation" to the Aquarium featuring penguin graphics. The Aquarium's audience development plan was also helped by radio spots highlighting the new dolphin and sea lion shows and the renovated beluga whale tank. Heightened public awareness of the Aquarium was paralleled by a significant increase in attendance.

The year's Zoo celebrations included Zoo Mask, Elephant Weekend, and the fourth annual Great

Egg Event. These large-scale public events continue to provide creative wildlife education and entertainment to thousands of families. Event activities ranged from becoming a cheetah for a day with the expert help of makeup artists to celebrating spring animal births by marching through the Zoo in a massive parade led by Grandmother Earth, a fifteen-foot puppet.

New public relations and advertising programs were also developed by the staff for the Society's Wildlife Conservation International division and for the travel, education, and membership programs.

#### Travel Department

Eighteen tours arranged by the Travel Department brought 324 NYZS members closer not only to wildlife in various parts of the world but also to the work of the Society's international conservation program. On two trips to Punta Tombo in Patagonia, Argentina, participants even joined in the banding of 8,000 Magellanic penguins to assist Dr. Dee Boersma in her biological and conservation research.

Other highlights included the "Ultimate Safari," through which members were introduced to several East African projects being conducted by NYZS scientists, including Dr. David Western in Amboseli National Park, Kenya, and Dr. Thomas Struh-saker in Kibale Forest, Uganda. Both trips were led by Dr. Archie Carr, III, assistant director of Wildlife Conservation International (WCI). There were also tours to Australia, the People's Republic of China, the Red Sea, Botswana and Namibia, Trinidad and Tobago, Ecuador and the Galapagos, Manu National Park and Machu Picchu in Peru, Cape Cod, the Hudson River, and the Society's Wildlife Survival Center on St. Catherines Island, Georgia.



"Taxi-Tops" advertised the Aquarium and Bronx Zoo throughout the City.



### "Paradise Lost?"

The question was posed in the special June/July issue of *Animal Kingdom*, which was devoted entirely to an investigative report about the problems threatening the Serengeti-Mara ecosystem in Kenya and Tanzania. A complex web of circumstances—mismanagement of parks and refuges, political feuding, poaching, chaotic economic conditions, agricultural encroachment, changing tribal customs, uncontrolled tourism, and human indifference—endanger the ecological integrity of the area. The greatest wildlife spectacle on earth could vanish.

This precarious situation has gone largely unnoticed by the world outside the region, so *Animal Kingdom's* editors, having been alerted by NYZS Resource Ecologist David Western, assigned noted wildlife writer Edward R. Ricciuti to conduct an in-depth study of the problems and to consider solutions. Because of the urgency of the matter, the staff cancelled the planned June/July line-up and produced the special report on a compressed timetable. Funding from the Allied Foundation helped to cover extra costs required for such a major undertaking.

### Animal Kingdom growth

With this special issue, the magazine achieved a circulation of 132,000 and continued to move toward a higher degree of self-support. Advertising space, sold for the first time last year, increased steadily, and similar growth is projected for the coming year. The number of single copies distributed for sale at bookstores and newsstands has tripled since this marketing approach was launched less than two years ago. According to *Animal Kingdom's* national distributor, the NYZS magazine has grown in the single-copy area much more rapidly than other comparable magazines.

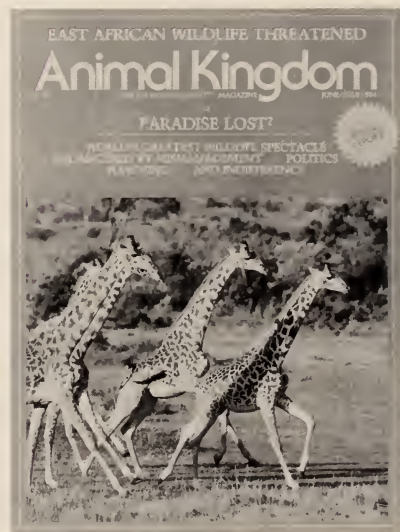
Single-copy sales also added to circulation by producing a substantial number of new subscription orders through cards and envelopes inserted into the magazine. A similar device called an "outsert," or cover wrap, used with the October/November and December/January issues yielded a large number of holiday gift-subscription orders. A direct-mail campaign for new circulation generated the best results ever produced by this type of promotion—a nearly three percent average return for all lists used and nearly four percent on the best list. Sales through catalog agencies, primarily to schools and libraries, were also the highest in the magazine's history. *Animal Kingdom's* renewal rate rose to sixty-four percent—considered high by industry standards—a tribute to *Animal Kingdom's* increasing editorial appeal and variety of content.

### Photographic Services

Among the thousands of photographs in the NYZS collection, negatives recording the Society's earliest days have been deteriorating badly with each passing year. In 1983, the photographic staff was able to take the first step toward protection by storing the early negatives in steel cabinets—a move which will slow deterioration but not prevent it. An extensive restoration project is needed to preserve this important documentation for future generations, but the major funding required has not been available thus far.

A large portion of photographic service time was devoted to providing visual support for a variety of fund-raising efforts: color transparencies and photos for the capital campaign slide show "Building for a Second Century" and for such specific projects as Jungle World, the Animal Health Center, the Snow Leopard Exhibition, and Zoo Court.

The division completed editing on two motion pictures: a report on the Wildlife Survival Center at St. Catherines Island and the ever-popular Zoo and Aquarium film shown at the annual members' meeting in February. Another Zoo-Aquarium film is now in the works, and the photographers have begun filming exhibit construction in Jungle World.



*Animal Kingdom* devoted an entire issue to East African conservation.



### Admissions, Parking, and Transportation

While attendance at the Bronx Zoo declined to 1,929,282 due to heavy spring rains and unseasonably hot weather, total visitors to the Aquarium exceeded 500,000 for the first time since 1976, reaching 529,599. The increasing prevalence of travel by car to the Zoo continued, with more than 250,000 vehicles using the Zoo's four parking lots.

Group sales, benefitting from reorganization of the department, showed dramatic improvement over previous years. The total number of people attending the Zoo in groups rose by seventy-three percent to 103,132 and the number of groups by fifty-four percent to 1,546. Marketing was directed especially to new programs for schools, senior groups, and senior citizens.

Within the Zoo, guided tour and transportation systems served 845,306 visitors. Most popular was the Bengali Express monorail in Wild Asia, with 331,202, followed by the Skyfari, with 316,059, and the Safari Tour Trains, with 198,045.

### Food and Souvenirs

In conjunction with the remodeling of Wild Asia Plaza, the food stand near the Bengali Express station was repositioned to the lower plaza, enlarged, and fitted with new equipment to expand visitor menu choices. This change provides more space in anticipation of the larger crowds that will use the upper plaza when Jungle World opens in 1985.

Souvenir sales were also at an all-time high. The Safari Shop was redecorated, and the service stands placed more emphasis on the design of the merchandise displayed and its appeal to a youthful audience.

Food sales were once again the highest in Bronx Zoo history. Among food items introduced during the year, cotton candy was one of the most successful.

The Aquarium also had an outstanding year in all areas of operation, with sales up twenty-three percent. A new souvenir stand was erected in the Children's Cove area and the souvenir shop was redecorated.

### Personnel

At the end of fiscal year 1984, the New York Zoological Society employed 956 people, 405 of them on the full-time staffs of the Bronx Zoo, the New York Aquarium, the Osborn Laboratories of Marine Sciences, the Wildlife Survival Center, and Wildlife Conservation International (listed by department on pages 69-72). NYZS employees encompass an unusual range of professions and functions, from curator and keeper to welder and auto mechanic,

from exhibition designer and carpenter to horticulturist and teacher.

The 551 seasonal workers were employed to help operate the Zoo and Aquarium from April through October, selling food and souvenirs, maintaining the grounds, guiding tours on the Bengali Express monorail and the Safari Tour Trains. These were young New Yorkers, primarily from the Bronx and Brooklyn, for many of whom working at the Zoo or Aquarium was their first job.

Department staff members were once again active in presenting papers and programs at workshops, symposiums, and conferences. In addition, the Personnel Department represented the New York Zoological Society in career workshops at several area colleges and high schools.



The Skyfari began its twelfth year of operation in 1984.

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Caribbean flamingos raised several chicks last year near the Aquatic Bird House.







During the fiscal year from July 1, 1983, through June 30, 1984, expenditures for general purposes were \$23,971,928 and exceeded revenues by \$188,965. Expenditures for capital projects were \$4,410,605, exceeding \$4,000,000 for the second consecutive year.

Contributions and fund-raising events provided eleven percent of general operating support. A new capital campaign begun last year raised nearly \$8,000,000. An additional \$2,600,000 in pledges and contributions to the Society's endowment funds were received. Altogether, the Society's efforts raised \$13,496,529, almost \$7,000,000 more than last year's total.

The City of New York increased its basic operating support by fourteen percent to \$6,622,160, accounting for twenty-eight percent of the Society's revenue. The City continued to be the largest single source of support, providing funds for 205 animal keepers and maintainers. In addition, it committed \$605,000 at the Zoological Park and \$2,361,000 at the Aquarium toward capital expenditures. New York State provided \$1,325,950 through the Natural Heritage Trust, a thirty-seven percent increase over last year's support. Federal funds provided \$330,801 for education and marine science activities and research.

Visitor attendance declined five percent at the Zoological Park and increased fifteen percent at the Aquarium. Though combined attendance declined modestly, admissions revenues increased nine percent to \$2,494,751. The Zoo's free admission policy on Tuesdays, Wednesdays, and Thursdays enabled fifty-seven percent of all visitors to enter without paying admission fees. Improved marketing efforts resulted in a ten percent increase in visitor per capita spending at the Zoo and twelve percent at the Aquarium.

Membership dues and travel revenues increased thirty-one percent and generated six percent of operating revenues. Interest and dividend income accounted for seven percent of revenues. *Animal Kingdom* magazine, through the sale of advertising space, halved its deficit to \$100,000. The annualized return on the Society's portfolio over the last four years was 19.6 percent. This performance placed the Society's portfolio in the top thirteenth percentile of such funds.

### Expenditures

Personnel costs accounted for fifty-six percent of the Society's general operating expenditures. Heat, light, and power costs increased twelve percent, while the City continued to underwrite this expense substantially by contributing \$1,107,970 toward a total cost of \$1,396,585. The cost-of-goods-sold percentage declined two percent for food sales and increased six percent

for souvenirs; the latter reflects a trend toward increased apparel purchases where mark-ups are lower. Other items reflected only moderate cost increases as inflation abated over the past year.

### Capital projects

At the Zoological Park, work continued on the Jungle World exhibition, which is scheduled to open in the spring of 1985. Funds necessary to complete much of this project were generously donated by Mrs. Enid A. Haupt. The new Animal Health Center progressed on schedule and will open officially in the spring. This joint effort of the Society and the City of New York will provide the necessary facilities to care for the wildlife collections at the Zoological Park and Aquarium, as well as the City Zoos, as they are brought on line. Other projects include renovation of the Elephant House and a cogeneration and district heating system to replace the Zoological Park's aging power plant.

Additional plans and designs were developed for the Discovery Cove exhibit at the Aquarium, and construction should begin next spring. An economic analysis is underway to determine the feasibility of a whale and dolphin arena, while plans for a new seawater system were completed, and construction is scheduled to begin in the fall.

Plans for the complete renovation of Central Park Zoo were submitted to the City, and bids were let. Final approval from the Board of Estimate is expected before the end of 1984; and construction is anticipated to begin early next year.

**David T. Schiff**  
Treasurer



An Eli Harvey lion shield on the 1903 Lion House.



Peat, Marwick, Mitchell & Co.  
Certified Public Accountants  
345 Park Avenue  
New York, NY 10154

The Board of Trustees  
New York Zoological Society:

We have examined the balance sheet of New York Zoological Society as of June 30, 1984 and the related statements of support and revenue, expenditures, capital additions and changes in fund balances and of changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As explained in note 1 to the financial statements, expenditures for land, buildings, and equipment are not capitalized, and depreciation of buildings and equipment is, therefore, not recorded. Such practices are not in accordance with generally accepted accounting principles.

In our opinion, except for the effect on the financial statements of the matter discussed in the preceding paragraph, the aforementioned financial statements present fairly the financial position of New York Zoological Society at June 30, 1984 and the results of its operations and the changes in its financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

September 14, 1984

*Peat, Marwick, Mitchell & Co.*



Pygmy hippos learn some lessons early.

**New York Zoological Society**  
**Balance Sheet**  
June 30, 1984

Assets	Operating funds	Endowment funds
Cash, including short-term investments of \$400,000	\$ 1,480,866	—
Investments (note 2)	11,860,849	17,634,374
Accounts receivable	614,680	—
Grants and pledges receivable	7,223,419	—
Inventories, at lower of cost or market	494,021	—
Prepaid expenses and deferred charges	645,585	—
	<u>\$ 22,319,420</u>	<u>17,634,374</u>
<b>Liabilities and fund balances</b>		
Accounts payable and accrued expenses	2,357,075	—
Deferred restricted support and revenue (note 5)	12,094,238	—
	<u>14,451,313</u>	<u>—</u>
Fund balances:		
Unrestricted:		
Designated for long-term investment	6,758,779	—
Undesignated	1,109,328	—
Endowment:		
Income unrestricted	—	5,871,189
Income restricted	—	6,760,997
Term endowment—income unrestricted	—	5,002,188
	<u>7,868,107</u>	<u>17,634,374</u>
	<u>\$ 22,319,420</u>	<u>17,634,374</u>

*See accompanying notes to financial statements.*



Capybaras, the world's largest rodents have been breeding at the Bronx Zoo since 1978.

**Statement of Support and Revenue, Expenditures, Capital Additions, and Changes in Fund Balances**  
**Year ended June 30, 1984**

	Operating funds			Endowment funds
	General	Capital	Total	
Operating support and revenue:				
Contributions and fund raising events, net (note 3)	\$ 2,577,080	3,507,025	6,084,105	—
Government support:				
City of New York (note 8)	6,622,160	9,990	6,632,150	—
Other	1,656,751	50,000	1,706,751	—
Admission charges	2,494,751	—	2,494,751	—
Visitor services revenues	6,261,185	737,550	6,998,735	—
Membership dues and travel	1,371,023	—	1,371,023	—
Endowment and other investment income (note 4)	1,577,656	79,903	1,657,559	—
Publications and related revenues	776,341	—	776,341	—
Education program revenues	182,122	—	182,122	—
Collection sales	—	26,137	26,137	—
Miscellaneous revenue	263,894	—	263,894	—
<b>Total operating support and revenue</b>	<b>23,782,963</b>	<b>4,410,605</b>	<b>28,193,568</b>	<b>—</b>
Expenditures:				
Program services:				
Zoological Park	14,415,460	2,652,794	17,068,254	—
Aquarium	3,003,412	257,117	3,260,529	—
Survival Center	204,509	—	204,509	—
Wildlife Conservation International	899,862	—	899,862	—
Marine Sciences	360,071	—	360,071	—
Publications	876,866	—	876,866	—
Membership activities	913,118	—	913,118	—
City Zoos project (note 7)	—	1,250,872	1,250,872	—
<b>Total program services</b>	<b>20,673,298</b>	<b>4,160,783</b>	<b>24,834,081</b>	<b>—</b>
Supporting services:				
Management and general	2,055,564	249,822	2,305,386	—
Fund raising	1,243,066	—	1,243,066	—
<b>Total supporting services</b>	<b>3,298,630</b>	<b>249,822</b>	<b>3,548,452</b>	<b>—</b>
<b>Total expenditures</b>	<b>23,971,928</b>	<b>4,410,605</b>	<b>28,382,533</b>	<b>—</b>
Excess of expenditures over operating support and revenue, carried forward	(188,965)	—	(188,965)	—



Statement of Support and Revenue, Expenditures, Capital Additions, and Changes in Fund Balances (cont'd.)

	Operating funds			Endowment funds
	General	Capital	Total	
Excess of expenditures over operating support and revenue, brought forward	\$ (188,965)	—	(188,965)	—
Bequests	114,394	—	114,394	—
Realized net gains on investments	692,105	—	692,105	—
Excess of support and revenue over expenditures before capital additions	617,534	—	617,534	—
Capital additions:				
Contributions	—	—	—	2,062,610
Realized net gains on investments	—	—	—	1,514,599
Total capital additions	—	—	—	3,577,209
Excess of support and revenue over expenditures after capital additions	617,534	—	617,534	3,577,209
Fund balances at beginning of year	7,250,573	—	7,250,573	16,304,279
Other changes — expiration of term endowment (note 3)	—	—	—	(2,247,114)
Fund balances at end of year	<u>\$ 7,868,107</u>	<u>—</u>	<u>7,868,107</u>	<u>17,634,374</u>

See accompanying notes to financial statements.



Three Travancore tortoises hatched during the year in the Society's long-range breeding program for this species.

**Statement of Changes in Financial Position**  
Year ended June 30, 1984

	Operating funds	Endowment funds
Resources provided:		
Excess of support and revenue over expenditures before capital additions	\$ 617,534	—
Capital additions:		
Contributions	—	2,062,610
Realized net gains on investments	—	1,514,599
Excess of support and revenue over expenditures after capital additions	617,534	3,577,209
Items which do not provide resources—realized net gain on investments	(893,232)	(1,514,599)
Proceeds from sale of investments	47,711,712	80,891,285
Increase in deferred restricted support and revenue	7,085,221	—
Total resources provided	54,521,235	82,953,895
Resources used:		
Increase in accounts receivable	102,861	—
Decrease in accounts payable and accrued expenses	557,327	—
Increase in inventories	169,632	—
Increase in grants and pledges receivable	5,495,314	—
Increase in prepaid expenses and deferred charges	253,858	—
Purchase of investments	47,616,457	80,706,781
Total resources used	54,195,449	80,706,781
Other changes—expiration of term endowment	—	(2,247,114)
Increase in cash	\$ 325,786	—

*See accompanying notes to financial statements.*

**Notes to Financial Statements**  
June 30, 1984

**(1) Summary of significant accounting policies**

The financial statements of the Society have been prepared on the accrual basis except for depreciation as explained below. Other significant accounting policies follow:

**Fund accounting**

In order to ensure observance of limitations and restrictions placed on the use of available resources, the accounts are maintained in accordance with the principles of fund accounting. This is the procedure by which resources for various purposes are classified for accounting and reporting purposes into funds established according to their nature and purposes. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups.

(continued)

Notes to Financial Statements (continued)

The assets, liabilities and fund balances of the Society are reported in two self-balancing fund groups:

**Operating funds**, which include unrestricted and restricted resources:

- Unrestricted funds represent the funds available for the support of Society operations.
- Funds restricted by the donor, grantor, or other outside party for particular operating purposes (including accessions and other capital additions) are deemed to be earned and reported as revenues of operating funds when the Society has incurred expenditures in compliance with the specific restrictions. Such amounts received but not yet earned are reported as deferred restricted support.

**Endowment funds**, which include the following restricted resources:

- Funds that are subject to restrictions of gift instruments requiring in perpetuity that the principal be invested and only the income be used.
- Term endowment funds which must be held intact except that, at some future date or specified occurrence, some portion or all of the principal may be used (see note 3).

**Plant assets and depreciation**

Expenditures of operating funds for plant acquisitions including buildings and improvements constructed on land owned by the City of New York are not capitalized and, accordingly, depreciation is not recorded in the Society's financial statements.

**Collections**

Expenditures for collections are not capitalized.

**Other matters**

All gains and losses arising from the sale, collection or other disposition of investments and other noncash assets are accounted for in the fund that owned the assets. Ordinary income from investments, receivables, and the like is accounted for in the fund owning the assets, except for income derived from investments of endowment funds, which is accounted for, if unrestricted, as revenue of the unrestricted operating fund or, if restricted, as deferred amounts until the terms of the restriction have been met.

Enforceable pledges for operating purposes, less an allowance for uncollectible amounts, are recorded as receivables in the year made. Pledges for support of current operations are recorded as operating fund support. Pledges for support of future operations are recorded as deferred amounts in the operating fund. Pledges to the term endowment fund are recognized upon payment of the pledge.

**(2) Investments**

Investments are reflected at cost or fair market value at date of gift. The market value and carrying value of investments by fund at June 30, 1984, were as follows:

	Market value	Carrying value
Operating funds—expendable	\$12,534,298	11,860,849
Endowment funds—nonexpendable	19,213,444	17,634,374
	<u>\$31,747,742</u>	<u>29,495,223</u>

Details of investment assets at June 30, 1984, were as follows:

	Market value	Carrying value
Cash	\$ 152,721	152,721
Short-term investments	3,156,000	3,156,000
Corporate stocks	24,819,333	22,199,002
U. S. Government obligations	3,619,688	3,987,500
	<u>\$31,747,742</u>	<u>29,495,223</u>

(continued)

## Notes to Financial Statements (continued)

Investment assets of endowment funds and operating funds are pooled on a market value basis with each individual fund subscribing to or disposing of units on the basis of the value per unit at market value, determined quarterly. Of the total units, each having a market value of \$179.88, 106,813 units were owned by the endowment funds and 69,682 units were owned by operating funds at June 30, 1984. The average earnings per unit, exclusive of net gains, approximated \$8.37 for the year.

The following tabulation summarizes changes in relationships between carrying values and market values of investment assets:

	Market value	Carrying value	Net gains (losses)	Market value per unit
End of year	\$31,747,742	29,495,223	2,252,519	179.88
Beginning of year	<u>35,234,742</u>	<u>27,367,151</u>	<u>7,867,591</u>	<u>213.01</u>
Unrealized net loss for year			(5,615,072)	
Realized net gains for year			<u>2,407,831</u>	
Total net loss for year			<u><u>\$(3,207,241)</u></u>	<u>(33.13)</u>

The New York State Not-for-Profit Corporation Law, which became effective on September 1, 1970, permits the use of gains on investment transactions of endowment funds. Such gains are currently being added to principal but may be utilized at the discretion of the Board of Trustees.

### (3) Term endowment (Animal Kingdom Fund)

During 1976, the Society initiated a capital funds campaign. The campaign included a term endowment fund to serve various functions, as described below, subject to the following conditions:

- (a) The income of the term endowment fund shall be used for the general operating purposes of the Society; and
- (b) The principal of the term endowment fund may be expanded only upon the affirmative vote of two-thirds of the Trustees present at any duly held meeting of the Board of Trustees or its Executive Committee: (i) to finance programs or improvements to facilities (i.e., the Zoological Park, the New York Aquarium, or other facilities of the Society) to produce revenue or increase attendance; or (ii) to ensure the survival of the Society if funds from other sources fail to provide sufficient revenue to maintain the Society's programs; provided, however, that in the case of any contribution to the term endowment fund which was subject to a restriction not to expend the principal of such contribution without the prior consent of the donor thereof, in addition to the vote of the Trustees described above, such consent must be obtained in writing prior to the expenditure of such principal. For the year ended June 30, 1984, the Society recognized as operating support and revenue expired term endowment aggregating \$2,247,114. During Fiscal 1984, approximately \$2,500,000 of term endowment funds were reclassified as endowment funds.

### (4) Pension plan

All eligible Society employees are members of the Cultural Institutions Retirement System's (CIRS) Pension Plan. Pension expense was approximately \$940,000, of which approximately \$476,000 was financed by an appropriation from the City of New York. The current year's provision includes amortization of prior service costs over a period of 30 years commencing June 30, 1974. The Society's policy is to fund pension cost accrued and no unfunded vested benefits existed as of June 30, 1983, the date of the latest plan valuation.

Because the CIRS Plan is a multi-employer plan, certain information as it relates to vested and non-vested benefits as well as plan assets is not readily available.

Certain employees of the Society were formerly participants in the Society's pension fund. Effective January 1,

(continued)



## Notes to Financial Statements (continued)

1975, benefits of the CIRS Plan were substituted for benefits previously accrued under the Society's pension fund. The market value of the assets of the pension fund approximated \$2,300,000 as of June 30, 1984 and exceeded the past service liability associated with the participants of the former plan. It is intended that these assets be used to fund current pension costs. During 1984, \$95,000 of investment income is reflected in the financial statements.

### (5) Deferred restricted support and revenue

The changes in deferred restricted support and revenue for the year ended June 30, 1984, are as follows:

Balance at beginning of year	\$ 5,009,017
Additions:	
Contributions and fund raising events	9,643,907
Fees and grants from governmental agencies	38,953
Investment income	316,123
Net gain on investment transactions	201,127
Other	187,683
	<u>15,396,810</u>
Less funds expended during year	<u>3,302,572</u>
Balance at end of year	<u><u>\$12,094,238</u></u>

### (6) Collections

During the year ended June 30, 1984, animal collection accessions aggregated approximately \$185,000 while deaccessions aggregated approximately \$26,000.

### (7) City Zoos Project

The Society and the City of New York have entered into agreements with respect to the Central Park Zoo, Prospect Park Zoo, and Flushing Meadows Zoo. Each agreement provides for the City's renovation of these zoos in accordance with plans developed through consultation with the Society and approved by the City, and thereafter, for the Society's operation and management of each with funding from the City, for an initial 50-year term, renewable by the Society for five additional 10-year terms. Except for the Central Park Zoo, the Society will expend no monies for construction. The Society has committed approximately \$7,200,000 toward design and renovation costs at the Central Park Zoo.

### (8) City of New York support

The City of New York, in addition to providing general operating support through the Department of Cultural Affairs, has reported to the Society that during Fiscal 1984 it committed (contracts let) \$605,000 at the Zoological Park and \$2,361,000 at the Aquarium for capital improvements. Such amounts are not included in the accompanying financial statements.

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